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First Vice President of the American Pharmaceutical Association 1858-59.

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AMERICAN
PHARMACEUTICAL ASSOCIATION

AT THE
FIFTIETH ANNUAL MEETING

HELD AT
PHILADELPHIA, PA., SEPTEMBER, 1902.

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Oct. 6, 1852..	Philadelphia, Pa.	<i>Daniel B. Smith</i> , Philadelphia.	<i>George W. Andrews</i> , Baltimore.	<i>Samuel M. Colcord</i> , Boston.	<i>C. Augustus Smith</i> , Cincinnati.
Aug. 24, 1853..	Boston, Mass.	<i>William A. Brewer</i> , Boston.	<i>George D. Coggeshall</i> , New York.	<i>Alexander Duval</i> , Richmond, Va.	Charles B. Guthrie, Memphis, Tenn.
July 25, 1854..	Cincinnati, O.	<i>William B. Chapman</i> , Cincinnati.	<i>Henry T. Cummings</i> , Portland, Me.	<i>John Meakim</i> , New York.	<i>Joseph Laidley</i> , Richmond, Va.
Sept. 11, 1855..	New York, N. Y.	<i>John Meakim</i> , New York.	Charles B. Guthrie, Memphis, Tenn.	<i>Charles Ellis</i> , Philadelphia.	<i>Henry F. Fish</i> , Waterbury, Conn.
Sept. 9, 1856..	Baltimore, Md.	<i>George W. Andrews</i> , Baltimore.	<i>John L. Kidwell</i> , Washington, D. C.	Frederick Stearns, Detroit, Mich.	<i>Henry T. Kiersted</i> , New York.
Sept. 8, 1857..	Philadelphia, Pa.	<i>Charles Ellis</i> , Philadelphia.	<i>James Cooke</i> , Fredericksburg, Va.	<i>Samuel P. Peck</i> , Bennington, Vt.	A. E. Richards, Plaquemine, La.
Sept. 14, 1858..	Washington, D. C.	<i>John L. Kidwell</i> , Georgetown, D. C.	<i>Edward R. Squibb</i> , Brooklyn, N. Y.	<i>James O'Gallagher</i> , St. Louis.	Robert Battey, Rome, Ga.
Sept. 13, 1859..	Boston, Mass.	<i>Samuel M. Colcord</i> , Boston.	<i>William Procter, Jr.</i> , Philadelphia.	<i>Joseph Roberts</i> , Baltimore.	Edwin O. Gale, Chicago.
Sept. 11, 1860..	New York, N. Y.	<i>Henry T. Kiersted</i> , New York.	William J. M. Gordon, Cincinnati.	<i>William S. Thompson</i> , Baltimore.	<i>Theodore Metcalf</i> , Boston.
Aug. 27, 1862..	Philadelphia, Pa.	<i>William Procter, Jr.</i> , Philadelphia.	<i>John Milhan</i> , New York.	<i>Eugene L. Massot</i> , St. Louis.	<i>J. Faris Moore</i> , Baltimore.
Sept. 8, 1863..	Baltimore, Md.	<i>J. Faris Moore</i> , Baltimore.	<i>John M. Maisch</i> , Philadelphia.	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>George W. Weyman</i> , Pittsburg.
Sept. 21, 1864..	Cincinnati, O.	William J. M. Gordon, Cincinnati.	<i>Richard H. Stabler</i> , Alexandria, Va.	Enno Sander, St. Louis.	<i>Thomas Hollis</i> , Boston.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865..	Boston, Mass.	<i>Henry W. Lincoln</i> , Boston.	<i>George C. Close</i> , Brooklyn, N. Y.	<i>Elijah W. Sackrider</i> , Cleveland, O.	<i>Charles A. Heinitsch</i> , Lancaster, Pa.
Aug. 22, 1866..	Detroit, Mich.	Frederick Stearns, Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	Ezekiel H. Sargent, Chicago.	<i>John W. Shedden</i> , New York.
Sept. 10, 1867..	New York, N. Y.	<i>John Milbau</i> , New York.	<i>Robert J. Brown</i> , Leavenworth, Kan.	<i>N. Hynson Jennings</i> , Baltimore.	<i>Daniel Henchman</i> , Boston.
Sept. 8, 1868..	Philadelphia, Pa.	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Bringhurst</i> , Wilmington, Del.	<i>Edward S. Wayne</i> , Cincinnati.	Albert E. Ebert, Chicago.
Sept. 7, 1869..	Chicago, Ill.	Ezekiel H. Sargent, Chicago.	<i>Ferdinand W. Sennewald</i> , St. Louis.	<i>John H. Pope</i> , New Orleans.	Joel S. Orne, Cambridgeport, Mass.
Sept. 13, 1870..	Baltimore, Md.	<i>Richard H. Stabler</i> , Alexandria, Va.	Fleming G. Grieve, Milledgeville, Ga.	James G. Steele, San Francisco.	<i>Eugene L. Massot</i> , St. Louis.
Sept. 12, 1871..	St. Louis, Mo.	Enno Sander, St. Louis.	C. Lewis Diehl, Louisville, Ky.	<i>George F. H. Markoe</i> , Boston.	<i>Matthew F. Ash</i> , Jackson, Miss.
Sept. 3, 1872..	Cleveland, O.	Albert E. Ebert, Chicago.	<i>Samuel S. Garrigues</i> , East Saginaw, Mich.	Edward P. Nichols, Newark, N. J.	<i>Henry C. Gaylord</i> , Cleveland, O.
Sept. 16, 1873..	Richmond, Va.	John F. Hancock, Baltimore.	William Saunders, London, Ont.	John T. Buck, Jackson, Miss.	<i>Paul Balluff</i> , New York.
Sept. 8, 1874..	Louisville, Ky.	C. Lewis Diehl, Louisville, Ky.	<i>Joseph Roberts</i> , Baltimore.	William T. Wenzell, San Francisco.	<i>Augustus R. Bayley</i> , Cambridgeport, Mass.
Sept. 7, 1875..	Boston, Mass.	<i>George F. H. Markoe</i> , Boston.	Frederick Hoffmann, New York.	T. Roberts Baker, Richmond, Va.	Christian F. G. Meyer, St. Louis.
Sept. 12, 1876..	Philadelphia, Pa.	<i>Charles Bullock</i> , Philadelphia.	Samuel A. D. Sheppard, Boston.	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Jacob D. Wells</i> , Cincinnati.
Sept. 4, 1877..	Toronto, Can.	William Saunders, London, Ont.	Ewen McIntyre, New York.	<i>John Ingalls</i> , Macon, Ga.	<i>Emlen Painter</i> , San Francisco.

LIST OF OFFICERS (Continued).

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Nov. 26, 1878...	Atlanta, Ga.....	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Frederick T. Whiting</i> , Great Barrington, Mass.	Henry J. Rose, Toronto, Can.	<i>William H. Crawford</i> , St. Louis.
Sept. 9, 1879...	Indianapolis, Ind. . .	<i>George W. Sloan</i> , Indianapolis, Ind.	T. Roberts Baker, Richmond, Va.	Joseph L. Lemberger, Lebanon, Pa.	Philip C. Candidus, Mobile, Ala.
Sept. 14, 1880...	Saratoga, N. Y.	James T. Shinn, Philadelphia.	George H. Schafer, Fort Madison, Ia.	<i>William S. Thompson</i> , Washington, D. C.	William Simpson, Raleigh, N. C.
Aug. 23, 1881...	Kansas City, Mo.....	<i>P. Wendover Bedford</i> , New York.	<i>Emlen Painter</i> , San Francisco.	George Leis, Lawrence, Kan.	<i>John F. Judge</i> , Cincinnati.
Sept. 12, 1882...	Niagara Falls, N. Y...	<i>Charles A. Heinitch</i> , Lancaster, Pa.	<i>John Ingalls</i> , Macon, Ga.	Louis Dohme, Baltimore.	<i>William B. Blanding</i> , Providence, R. I.
Sept. 11, 1883...	Washington, D. C....	<i>William S. Thompson</i> , Washington, D. C.	<i>Charles Rice</i> , New York.	<i>Frederick H. Masi</i> , Norfolk, Va.	Edward W. Runyon, San Francisco.
Aug. 26, 1884...	Milwaukee, Wis	<i>John Ingalls</i> , Macon, Ga.	<i>John A. Dadd</i> , Milwaukee, Wis.	Henry Canning, Boston.	<i>Charles F. Goodman</i> , Omaha, Neb.
Sept. 8, 1885...	Pittsburgh, Pa.....	<i>Joseph Roberts</i> , Baltimore.	Albert H. Hollister, Madison, Wis.	Albert B. Prescott, Ann Arbor, Mich.	Joseph S. Evans, West Chester, Pa.
Sept. 7, 1886...	Providence, R. I.....	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>Henry J. Menninger</i> , Brooklyn, N. Y.	<i>M. W. Alexander</i> , St. Louis.	Norman A. Kuhn, Omaha, Neb.
Sept. 5, 1887...	Cincinnati, O.	John U. Lloyd, Cincinnati.	<i>M. W. Alexander</i> , St. Louis.	A. K. Finlay, New Orleans.	Karl Simmon, St. Paul, Minn.
Sept. 3, 1888...	Detroit, Mich	<i>M. W. Alexander</i> , St. Louis.	Jas. Vernor, Detroit, Mich.	<i>Fred. Wilcox</i> , Waterbury, Conn.	Alvin A. Yeager, Knoxville, Tenn.
June 24, 1889...	San Francisco, Cal...	<i>Emlen Painter</i> , New York.	Karl Simmon, St. Paul, Minn.	Wm. M. Searby, San Francisco.	Jos. W. Eckford, Aberdeen, Miss.
Sept. 8, 1890...	Old Pt. Comfort, Va.	<i>A. B. Taylor</i> , Philadelphia.	A. B. Stevens, Ann Arbor, Mich.	Chas. E. Dohme, Baltimore.	Jas. M. Good, St. Louis.

LIST OF OFFICERS (Concluded).

LIST OF OFFICERS OF THE ASSOCIATION.

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Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
April 27, 1891..	New Orleans, La.....	A. K. Finlay, New Orleans.	Geo. J. Seabury, New York.	W. H. Torbert, Dubuque, Ia.	L. T. Dunning, Sioux Falls, S. Dak.
July 14, 1892..	Profile House, N. H.	Jos. P. Remington, Philadelphia.	A. P. Preston, Portsmouth, N. H.	Sidney P. Watson, Atlanta, Ga.	Wm. H. Averill, Frankfort, Ky.
Aug. 14, 1893..	Chicago, Ill.....	Edgar L. Patch, Boston.	Leo Eliel, South Bend, Ind.	Wiley Rogers, Louisville, Ky.	Chas. Caspari, Jr., Baltimore.
Sept. 3, 1894..	Asheville, N. C.	William Simpson, Raleigh, N. C.	Chas. M. Ford, Denver, Colo.	Jno. N. Hurty, Indianapolis, Ind.	Jos. E. Morrison, Montreal, Can.
Aug. 14, 1895..	Denver, Colo.	James M. Good, St. Louis.	Chas. E. Dohme, Baltimore.	Adolph Brandenberger, Jefferson City, Mo.	Mrs. M. O. Miner, Hiawatha, Kan.
Aug. 12, 1896..	Montreal, Can	Joseph E. Morrison, Montreal, Can.	Geo. F. Payne, Atlanta, Ga.	Wm. A. Frost, St. Paul, Minn.	Geo. W. Parisen, Perth Amboy, N. J.
Aug. 23, 1897..	Lake Minnetonka, } Minn	Henry M. Whitney, Lawrence, Mass.	George C. Bartells, Camp Point, Ills.	Wm. S. Thompson, Washington, D. C.	Jacob A. Miller, Harrisburg, Pa.
Aug. 29, 1898..	Baltimore, Md	Charles E. Dohme, Baltimore.	George F. Payne, Atlanta, Ga.	James H. Beal, Scio, O.	Miss Josie A. Wanous, Minneapolis, Minn.
Sept. 4, 1899..	Put-in-Bay, O	Albert B. Prescott, Ann Arbor, Mich.	Lewis C. Hopp, Cleveland, O.	Wm. L. Dewoody, Pine Bluff, Ark.	Henry R. Gray, Montreal, Can.
May 7, 1900..	Richmond, Va.	Jno. F. Patton, York, Pa.	James H. Beal, Scio, O.	Jno. W. Gayle, Frankfort, Ky.	E. A. Ruddiman, Nashville, Tenn.
Sept. 16, 1901..	St. Louis, Mo.....	Henry M. Whelpley, St. Louis.	Wm. M. Searby, San Francisco.	George F. Payne, Atlanta, Ga.	Wm. S. Thompson, Washington, D. C.
Sept. 8, 1902..	Philadelphia, Pa.....	Geo. F. Payne, Atlanta, Ga.	Wm. L. Cliffe, Philadelphia, Pa.	Eugene G. Eberle, Dallas, Texas.	Henry Willis, Quebec, Can.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852-54.
Samuel M. Colcord, Boston, 1854-56, and
 1857-59.

James S. Aspinwall, New York, 1856-57.
Ashel Boyden, Boston, 1859-60.
Henry Haviland, New York, 1860-63.

Y. Brown Baxley, Baltimore, 1863-65.
Charles A. Tufts, Dover, N. H., 1865-86.
Samuel A. D. Sheppard, Boston, 1886-1903.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852-53.
Edward Parrish, Philadelphia, 1853-54.
Edward S. Wayne, Cincinnati, 1854-55.

William J. M. Gordon, Cincinnati, 1855-59.
Charles Bullock, Philadelphia, 1859-60.
James T. Shinn, Philadelphia, 1860-62.

Peter W. Bedford, New York, 1862-63.
William Evans, Jr., Philadelphia, 1863-64.
Henry N. Rittenhouse, Philadelphia, 1864-65.

CORRESPONDING SECRETARIES.

William Procter, Jr., 1852-53, and
 1854-57.
William B. Chapman, Cincinnati, 1853-54.

Edward Parrish, Philadelphia, 1857-58.
Ambrose Smith, Philadelphia, 1858-59.
William Hegeman, New York, 1859-60.

Peter W. Bedford, New York, 1860-62, and 1863-65.
John M. Maisch, Philadelphia, 1862-63.

PERMANENT SECRETARIES.

John M. Maisch, Philadelphia, 1865-Sept.,
 1893.

Henry M. Whelpley, St. Louis (acting),
 August, 1893.

Joseph P. Remington, Philadelphia, 1893-94.
Chas. Caspari, Jr., Baltimore, 1894-96.

GENERAL SECRETARY.

Chas. Caspari, Jr., Baltimore, 1896-1903.

LOCAL SECRETARIES.

For the meeting
held in

1867.....*P. Wendover Bedford*.
 1868.....*Alfred B. Taylor*.
 1869.....*Henry W. Fuller*.
 1870.....*J. Faris Moore*.
 1871.....*William H. Crawford*.

For the meeting
held in

1872.....*Henry C. Gaylord*.
 1873.....*Thomas H. Hazard*.
 1874.....*Emil Scheffer*.
 1875.....*Samuel A. D. Sheppard*.
 1876.....*Adolphus W. Miller*.

For the meeting
held in

1877.....*Henry J. Rose*.
 1878.....*Jesse W. Rankin*.
 1879.....*Eli Lilly*.
 1880.....*Charles F. Fish*.
 1881.....*William T. Ford*.

LOCAL SECRETARIES.—*Concluded.*

For the meeting held in	For the meeting held in
1882..... <i>Hiram E. Griffith.</i>	1898.....Henry P. Hynson.
1883.....Charles Becker.	1899.....Lewis C. Hopp.
1884.....Henry C. Schranck.	1900.....T. Ashby Miller.
1885.....George A. Kelly.	1901.....H. M. Whelpley.
1886..... <i>William B. Blanding.</i>	1902.....Wm. L. Cliffe.
1887.....George W. Voss.	1903.....F. W. R. Perry.
1888.....James Vernor.	
1889.....Edward W. Runyon.	

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-91, and 1895-1903.	<i>Chas. Rice</i> , New York, N. Y., 1891-92.	Henry Kraemer, New York, N. Y., 1892-95.
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OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.

<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1880-81 Jos. P. Remington.	<i>Joseph Roberts.</i>	<i>Geo. W. Kennedy.</i>
1881-82 "	Wm. J. M. Gordon.	"
1882-83 "	"	"
1883-84 "	C. Lewis Diehl.	"
1884-85 "	<i>John A. Dadd.</i>	"
1885-86 "	C. Lewis Diehl.	"
1886-87 <i>Wm. S. Thompson.</i>	<i>H. J. Menninger.</i>	"
1887-88 Wm. H. Rogers.	Karl Simmon.	"
1888-89 Jas. M. Good.	<i>Emlen Painter.</i>	"
1889-90 "	<i>Wm. S. Thompson.</i>	"
1890-91 "	"	"
1891-92 "	"	"
1892-93 "	H. M. Whitney.	"

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION.—Continued.

	<i>Chairman.</i>	<i>Vice-Chairman.</i>	<i>Secretary.</i>
1893-94	Jas. M. Good.	H. M. Whitney.	Geo. W. Kennedy.
1894-95	Wm. S. Thompson.	"	"
1895-96	"	Wm. C. Alpers.	"
1896-97	"	Jas. M. Good.	"
1897-98	"	"	"
1898-99	"	"	"
1899-00	"	"	"
1900-01	"	"	"
1901-02	A. B. Prescott.	Chas. E. Dohme.	"
1902-03	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.

PAST AND PRESENT OFFICERS OF THE SECTIONS.

SECTION ON COMMERCIAL INTERESTS.		SECTION ON SCIENTIFIC PAPERS.	
<i>Chairman.</i>	<i>Secretary.</i>	<i>Chairman.</i>	<i>Secretary.</i>
1887-88.....A. H. Hollister.	J. W. Colcord.	1887-88.....T. Roberts Baker.	A. B. Lyons.
1888-89....."	"	1888-89.....Emlen Painter.	H. M. Whelpley.
1889-90.....Leo Eliel.	F. B. Kilmer.	1889-90.....H. M. Whelpley.	C. F. Dare.
1890-91.....Henry Canning.	W. L. Dewoody.	1890-91.....E. L. Patch.	C. S. N. Hallberg.
1891-92.....W. H. Torbert.	Arthur Bassett.	1891-92.....C. S. N. Hallberg.	H. W. Snow.
1892-93....."	"	1892-93.....C. T. P. Fennel.	F. G. Ryan.
1893-94.....Wiley Rogers.	Jas. O. Burge.	1893-94.....L. E. Sayre.	C. M. Ford.
1894-95.....Geo. J. Seabury.	"	1894-95.....A. R. L. Dohme.	Geo. B. Kauffman.
1895-96....."	Clay W. Holmes.	1895-96.....S. P. Sadtler.	W. C. Alpers.
1896-97.....Lewis C. Hopp.	E. D'Avignon.	1896-97.....W. C. Alpers.	V. Coblentz.
1897-98.....Joseph Jacobs.	Jas. H. Bobbitt.	1897-98.....Edward Kremers.	A. B. Lyons.
1898-99....."	"	1898-99.....Henry H. Rusby.	H. V. Arny.
1899-00.....Jas. M. Good.	Chas. A. Rapelye.	1899-00.....Frank G. Ryan.	Caswell A. Mayo.
1900-01.....Chas. A. Rapelye.	F. W. Meissner.	1900-01.....Oscar Oldberg.	Lyman F. Kebler.
1901-02.....F. W. Meissner.	E. G. Eberle.	1901-02.....Lyman F. Kebler.	Jos. W. England.
1902-03.....Thos. V. Wooten.	Wm. C. Anderson.	1902-03.....J. O. Schlotterbeck.	"

PAST AND PRESENT OFFICERS OF THE SECTIONS.—*Concluded.*

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.—*Con.*

SECTION ON PHARMACEUTICAL EDUCATION.

<i>Chairman.</i>	<i>Secretary.</i>
1887-88..... <i>Jahn F. Judge.</i>	H. M. Whelpley.
1888-89..... <i>P. W. Bedford.</i>	L. E. Sayre.
SECTION ON PHARMACEUTICAL LEGISLATION.	
<i>Chairman.</i>	<i>Secretary.</i>
1887-88.....R. F. Bryant.	W. P. De Forest.
1888-89.....C. W. Day.	J. N. Hurty.

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

<i>Chairman.</i>	<i>Secretary.</i>
1889-90..... <i>P. W. Bedford.</i>	A. B. Stevens.
1890-91.....Wm. Simon.	L. C. Hogan.
1891-92.....A. B. Stevens.	" "
1892-93.....R. G. Eccles.	" "
1893-94....."	" "

<i>Chairman.</i>	<i>Secretary.</i>
1894-95.....Jas. M. Good.	C. S. N. Hallberg.
1895-96.....C. S. N. Hallberg.	Jas. H. Beal.
1896-97....."	" "
1897-98.....Jas. H. Beal.	H. Gordon Webster.
1898-99.....A. B. Lyons.	C. B. Lowe.
1899-00.....C. B. Lowe.	J. A. Koch.
1900-01....."	" "
1901-02.....E. G. Eberle.	J. W. T. Knox.
1902-03.....J. W. T. Knox.	Harry B. Mason.

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

<i>Chairman.</i>	<i>Secretary.</i>
1900-01.....Henry P. Hynson.	F. W. E. Stedem.
1901-02.....F. W. E. Stedem.	Wm. Kaemmerer.
1902-03.....Geo. M. Beringer.	Wm. H. Burke.

AUTHORIZED AGENTS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Appointed by the President in compliance with the following resolutions :

Resolved, That the President be directed to appoint authorized agents, where needed in the different States, for the collection of dues, distribution of the Proceedings, etc.; such agents to be designated by the Treasurer and Permanent Secretary of the Association, and a list of the agents to be published in the Proceedings. (Passed at Baltimore, 1870.)

Resolved, That the President of this Association be requested to appoint, in every locality where more than three members reside, a local agent, whose duty it shall be to aid the Treasurer in the collection of members' dues in his section, and to procure new members by placing before the pharmacists, and others eligible to membership, the great advantages that they will derive from associating themselves with this body. (Passed at Indianapolis, 1879.)

Resolved, That whilst it is desirable that the authorized agents shall at all times render their accounts as promptly as convenient, it is especially to be desired that they render a complete account to the Treasurer of such moneys as are in their hands on the first day of August and December in each year, in order that the Treasurer may be able to make his yearly accounts as full as possible. (Passed by Council, 1883.)

<i>Alabama,</i>	Albert E. Brown, 14 N. Water St.,	Mobile.
<i>Arkansas,</i>	John B. Bond, Main and Fifth streets,	Little Rock.
	William L. Dewoody,	Pine Bluff.
<i>California,</i>	William T. Wenzell, 436 Oak street,	San Francisco.
	George B. Flint, 1101 Broadway,	Oakland.
<i>Dist. of Columbia,</i>	Walter G. Duckett, 22d st. and Penna. ave.,	Washington.
<i>Connecticut,</i>	John K. Williams, 391 Main street,	Hartford.
	Warren A. Spalding, 19 Church street,	New Haven.
<i>Delaware,</i>	Herbert K. Watson, 803 Market St.,	Wilmington.
<i>Georgia,</i>	Robert H. Land, 812 Broad street,	Augusta.
	Thomas A. Cheatham, Mulberry & 3d Sts.,	Macon.
	Sidney P. Watson, 137 Richardson street,	Atlanta.
<i>Idaho,</i>	David E. Smithson,	{ Emmett, Can-
		{ yon Co.
<i>Illinois,</i>	C. S. N. Hallberg, 358 Dearborn St.,	Chicago.
	Henry Biroth, 481 25th St.,	Chicago.
<i>Indiana,</i>	Henry J. Schlaepfer, Second and Main streets,	Evansville.
	Frank H. Carter, 772 Massachusetts avenue,	Indianapolis.
<i>Iowa,</i>	John W. Ballard, 106 West Second street,	Davenport.
	George H. Schafer, 713 Front street,	Fort Madison.
	Silas H. Moore, 525 Fourth street,	Sioux City.
<i>Kansas,</i>	George Leis, 747 Massachusetts street,	Lawrence.
<i>Kentucky,</i>	William H. Averill, 435 Main street,	Frankfort.
	C. Lewis Diehl, Third street and Broadway,	Louisville.
<i>Louisiana,</i>	Alexander K. Finlay, 124 Baronne street,	New Orleans.
<i>Maine,</i>	Noah S. Harlow, 4 Smith's Block,	Bangor.
	Edward A. Hay, Free and Middle sts.,	Portland.
<i>Maryland,</i>	D. M. R. Culbreth, 1307 N. Calvert street,	Baltimore.
<i>Massachusetts,</i>	S. A. D. Sheppard, 1129 Washington street,	Boston.

<i>Massachusetts,</i>	Joel S. Orne, 493 Main street, B. Frank Stacey, Thompson Square, Freeman H. Butler, 391 Middlesex street, James E. Blake, 64 North Second street, Thomas B. Nichols, 178 Essex street, Francis M. Harris, 814 Main street,	Cambridgeport. Charlestown. Lowell. New Bedford. Salem. Worcester.
<i>Michigan,</i>	Ottmar Eberbach, 12 South Main street, James Vernor, 235 Woodward avenue,	Ann Arbor. Detroit.
<i>Minnesota,</i>	Wm. A. Frost, cor. Selby & Western aves.,	St. Paul.
<i>Mississippi,</i>	Joseph W. Eckford, Commerce street,	Aberdeen.
<i>Missouri,</i>	James M. Good, 2348 Olive street, George Eyssell, 1036 Union ave.,	St. Louis. Kansas City.
<i>Nebraska,</i>	Autumn V. Pease,	Fairbury.
<i>New Hampshire,</i>	Andrew P. Preston, 2 Congress Block,	Portsmouth.
<i>New Jersey,</i>	Wm. M. Oliver, 132 Broad street, Hermann Klussmann, 110 First st., Maxwell Abernethy, 188 Newark avenue, Clarence P. Smith, 861 Broad street,	Elizabeth. Hoboken. Jersey City. Newark.
<i>New York,</i>	Charles H. Gaus, 202 Washington avenue, Rudolf C. Werner, 2592 Atlantic ave., Charles O. Rano, 1872 Niagara street, William L. Du Bois, 281 Main street, John Hepburn, 103 Main street, Harvey G. Goodale, P. O. Box 29, James T. King, Main and South streets, John McKesson, Jr., 91 Fulton street, Charles F. Fish, 348 Broadway, Charles W. Snow, 214 Warren street, William Blaikie, 202 Genesee street,	Albany. Brooklyn. Buffalo. Catskill. Flushing. Jamaica. Middletown. New York. Saratoga. Syracuse. Utica.
<i>North Carolina,</i>	William Simpson, 101 Fayetteville street, John H. Hardin, 124 South Front street,	Raleigh. Wilmington.
<i>Ohio,</i>	J. U. Lloyd, Court and Plum streets, George L. Hechler, 1099 Broadway, Charles Huston, 47 South High street, Thomas J. Casper, 41 East Main street,	Cincinnati. Cleveland. Columbus. Springfield.
<i>Oregon,</i>	Louis Blumauer, Fourth and Morrison streets,	Portland.
<i>Pennsylvania,</i>	Jacob A. Miller, Second and Chestnut streets, Joseph L. Lemberger, 5 North Ninth street, Richard M. Shoemaker, Fourth and Race streets, Philip M. Ziegler, 526 Penn street, Edward A. Cornell, Fourth and Pine streets, Oscar E. Thomas, 164 Main street,	Harrisburg. Lebanon. Philadelphia. Reading. Williamsport. Columbia.
<i>South Carolina,</i>	Jas. S. Robinson, Second and Madison streets, James O. Burge, Church and High streets,	Memphis. Nashville.
<i>Tennessee,</i>	Geo. J. F. Schmitt, 507 W. Commerce street,	San Antonio.
<i>Texas,</i>	T. Roberts Baker, Lester & Ash streets,	Richmond.
<i>Virginia,</i>	Henry E. Holmes,	Seattle.
<i>Washington,</i>	Edward Kremers,	Madison.
<i>Wisconsin,</i>	John R. Drake, 365 East Water street, Francis C. Simson, Pentagon Bldg., John A. Clark, E. King street, Henry R. Gray, 122 St. Lawrence Main street,	Milwaukee. Halifax. Hamilton. Montreal.

THE PERMANENT FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are three permanent Funds at the present time, all of which are invested in Government bonds, in the name of the Treasurer of the American Pharmaceutical Association, and kept in the custody of the Chairman of the Council.

THE LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named, a revised Constitution was reported by a committee, and, after consideration adopted (see Proceedings 1856, pp. 12, 14, 27 and 79). Article II., Section 7 (afterwards Section 8), contained the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members, and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings 1870, pp. 87-96), and this, with a few slight amendments adopted in 1896 and 1900, is in force at the present time, containing the following:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, *the interest of which for any current year only may be used by the Association for its expenses.*"

Chapter VI., Article 5, of the By-Laws adopted the same year, reads as follows:

"Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and again in 1896 and changed to Article IV., Chapter VIII. As now in force, it reads as follows:

"Any member not in arrears to the Association, who shall pay to the Treasurer the sum of \$75 during the first year of his connection therewith, or after five years \$70, or after ten years \$60, or after fifteen years \$50, or after twenty years \$40, or after twenty-five years \$30, or after thirty years \$20, or after thirty-five years \$10, also any member who shall have paid to the Treasurer annual dues for thirty-seven years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (page 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one

(until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings 1879, page 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, page 52) and again in 1896 (Proceedings, page 17) so as to apply also to those who have been members for over twenty years (see Chapter VII., Article 4 of By-Laws). Under this clause the life membership (new style) of the present roll is seventy-eight, as published in the Proceedings.

The Treasurer's report for 1880 (page 524) states the life membership fund to be \$75, for 1881 (p. 513) \$613, for 1882 (p. 608) \$685, for 1883 (p. 436) \$904.38, and for 1884 (p. 524) \$944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that \$316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund and be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147), it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of \$3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471), the Association ordered again a transfer to the same Fund of \$4,000.

Since 1887 the annual reports of the Chairman of the Council give the number of each bond of the Government securities in which the Life Membership Fund is invested. The report published on page 651 of the present volume shows that on July 1st, 1902, the value of the Life Membership Fund was \$12,617.01 (face value of securities only given), of which sum *the interest for any current year only may be used by the Association for its expenses.*

THE EBERT FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars, to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated *for conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing other meritorious contributions to knowledge; or for IMPROVED METHODS of determined merit, for the preparation of chemical or pharmacal products: the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; *provided*, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, page 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Chas. L. Mitchell; for 1877, to Fred. B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897 to Albert B. Prescott and Jas. W. T. Knox; for 1898 to Virgil Coblentz; for 1899 to Henry Kraemer; for 1900 to Edward Kremers and Oswald Schreiner; and for 1902 to J. O. Schlotterbeck and H. C. Watkins.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to \$683.43. Since 1887 the reports of the Chairman of the Council specify the securities in which this fund is invested. On July 1st, 1902 (Proceedings, p. 651), its reported value was \$795.07 (face value of securities only given). The *annual interest must be applied to a prize for an original investigation* meeting the requirements stated above.

THE CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left, which by subsequent collections made in Philadelphia was increased to \$525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees, to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund *to aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526-528), and adopted the name *Centennial Fund*.

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings 1880, p. 553), when \$582.81 had thus been received. In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII. (Proceedings 1881, pp. 190, 549). Members have not availed themselves of this Fund to the extent contemplated at its foundation; for the amounts paid out have been only \$7.50 to Robt. B. Warder for material used for investigations reported in 1885; \$96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings 1889, page 16); and \$32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892, \$50 to the same investigator in 1893, and \$50 again to the same investigator in 1894. In 1896 the sum of \$22.33 was paid to the Committee on Indicators for material used in their investigations.

The original sum of \$1107.81 (\$525 + \$582.81) had increased in 1883 to \$1232.76. Since 1887 the securities in which the Fund is invested are specified in the reports of the Chairman of the Council; the reported value was \$1678.40 (face value of securities only given) on July 1, 1902 (see Proceedings, p. 651). *The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science.*

THE GENERAL FUND.

In October, 1891 (see Proceedings 1892, page 13), the Council instructed the Treasurer to draw from the cash on deposit a sufficient sum and purchase therewith ~~three~~ bonds, one thousand dollars each, the same to be such bonds as shall be approved by the Finance Committee, said bonds to be registered in the name of the Treasurer of the American Pharmaceutical Association, and placed in the custody of the Chairman of the Council.

The investment was made in bonds of the American Security and Trust Company at Washington, D. C., for the sum of \$3021.62 (see Proceedings 1892, pages 27 and 28). On July 1, 1897, the above bonds were redeemed, and six (6) 4 per cent. bonds of the same company, each for \$500.00, taken at par and accrued interest.

At the Richmond meeting in 1900, the Chairman of the Council and the Treasurer were instructed to sell the bonds belonging to the General Fund and to place \$1000.00 of the proceeds into the treasury and the balance in the Life-Membership Fund (see Proceedings, 1900, p. 18).

Two of the bonds belonging to this Fund were sold February 23, 1901 for \$1012.56, leaving four bonds, each for \$500.00, on hand July 1, 1901 (see Proceedings 1901, p. 99).

The remaining four bonds were called in by the American Security and Trust Company of Washington, D. C., and the cash received therefor turned over to the Treasurer on August 6, 1902 (see Proceedings, 1902, p. 652).

PRIZES.

The resolutions adopted August 15, 1893 (see page 16, Proc. 1893) were amended September 1, 1898 (see page 98, Proc. 1898) to read as follows:

Resolved, That if worthy papers be presented, the Association award annually three prizes for the three most valuable papers, aggregating the sum of \$100.00, and apportioned as follows: \$50.00 for the first, \$30.00 for the second, and \$20.00 for the third prize.

Resolved, That a Committee of three be annually appointed by the President of the Association, their duty to be, first, to decide if one or more of the papers presented are worthy of a prize, and second, to decide upon the relative merits of such papers as are deemed worthy.

Resolved, That nothing in these resolutions shall be so construed at any time as to prevent the writer of the Ebert Prize paper from also receiving one of the Association Prizes for said paper.

The following resolutions were adopted September 1, 1898 (see page 98, Proc. 1898).

Resolved, That a prize be established to be known as the "Hermann Hager Memorial Prize," and of the value of \$50.00. That in bestowing said prize, preference shall be given to contributions on pharmaceutical science or art, as distinguished from those on allied branches, though it shall not be confined to such. That said prize shall be awarded only when, in the opinion of the Committee on General Prizes, a contribution shall be deemed worthy of the award.

Resolved, That a prize be established to be known as the "John M. Maisch Prize," of the value of \$50.00. Said prize to be awarded for research work in pharmacognosy only, on the recommendation of the Committee on General Prizes.

Resolved, That no one of the general Association prizes shall be awarded to the writer of a paper for which either the Hermann Hager Prize or the John M. Maisch Prize has been given.

For names of members of this Committee see page v.

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PREFATORY NOTICE.

At the forty-second annual meeting of the Association, held at Asheville, N. C., the Council determined that the distribution of the printed Minutes, together with the papers read at the meeting, in advance of the bound volume of the Proceedings, which plan had been in operation since 1891, should be discontinued. This action of Council was approved by the Association at large at the General Session held September 8, 1894.

With the view of securing for the Proceedings as wide a distribution as possible, and to enable members to complete their sets at very low figures, the Council, at the forty-third annual meeting held at Denver, Colo., decided that the price of the Proceedings for 1890 and all previous years be reduced to one-half of that heretofore published. The Association at the General Session held on August 20, 1895, approved the action of Council, and the Committee on Publication offer the different issues at the following rates :

	PAPER COVER.	BOUND CLOTH.
1851, 1852, 1853, 1854, 1855.....each	\$.13	\$
1857.....	.20	.25
1858, 1864, 1865	" .38	
1858, 1860, 1862, 1863, 1864, 1865	"	.50
1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873	" .50	.75
1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883.....	" 1.25	1.50
1884, 1885, 1886, 1887	" 1.75	2.00
1888, 1889, 1890	" 2.50	2.75
1891, 1892, 1893	" 5.00	5.50
1894.....	" 6.00	6.50
1895.....	" 5.50	6.00
1896, 1897, 1898, 1899, 1900, 1901, 1902	" 5.00	5.50

The reduced prices on all volumes published prior to 1891 do not include free delivery.

IN SETS (EXCLUSIVE OF THE POSTAGE OR EXPRESS CHARGES).

For any two or three volumes a discount of 10 per cent. on the above prices.

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For any more than thirty-two volumes a discount of 60 per cent. on the above prices.

1854, 1856 and 1859 are out of print; none published in 1861.

Beginning with the first issue, in 1851, the actual cost of partial or complete sets—bound in cloth as far as on hand—will be as follows :

To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.	To and Including	Number of Vols.	Price by Single Vols.	Price the Set Net.
1855	5	\$0 65	\$0 52	1873	20	\$9 90	\$5 04	1888	35	\$35 05	\$14 26
1857	6	0 98	0 72	1874	21	11 40	6 84	1889	36	38 40	15 36
1858	7	1 40	1 12	1875	22	12 90	7 74	1890	37	41 15	16 46
1860	8	1 90	1 52	1876	23	14 40	7 20	1891	38	46 65	18 66
1862	9	2 40	1 68	1877	24	15 90	7 95	1892	39	52 15	20 86
1863	10	2 90	2 03	1878	25	17 40	8 70	1893	40	57 65	23 06
1864	11	3 40	2 38	1879	26	18 90	9 45	1894	41	64 15	25 66
1865	12	3 90	2 63	1880	27	20 40	10 20	1895	42	70 15	28 06
1866	13	4 65	3 26	1881	28	21 90	10 95	1896	43	75 65	30 26
1867	14	5 40	3 78	1882	29	23 40	11 70	1897	44	81 15	32 46
1868	15	6 15	4 31	1883	30	24 90	12 45	1898	45	86 65	34 66
1869	16	6 90	4 14	1884	31	26 90	13 45	1899	46	92 15	36 86
1870	17	7 65	4 59	1885	32	28 90	14 45	1900	47	97 65	39 06
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1872	19	9 15	5 49	1887	34	32 90	16 16	1902	49	108 47	43 38

Orders for Proceedings should be sent to the General Secretary, 109 Aisquith street, Baltimore, Md.

The gold badge of the Association may be procured from the General Secretary on receipt of \$2.



Blank forms of application and recommendations for membership may be obtained from the General Secretary or from the Committee on Membership; when properly filled up they should be sent to the Secretary of the Committee on Membership, Henry M. Whelpley, St. Louis, Mo., at least one week before the meeting; if sent later, they should be addressed to him in the care of the Grand Hotel, Mackinac Island, Mich.

The fifty-first annual meeting of the Association will convene at Mackinac Island, Mich., on the first Monday (3d day) of August, 1903, at 3 o'clock, p. m.

MINUTES

OF THE

FIFTIETH ANNUAL MEETING.

THE Fiftieth Annual Meeting of the American Pharmaceutical Association—the Golden Jubilee meeting of the Association—was held in the city of Philadelphia, Pennsylvania, September 8–15, 1902, with headquarters at the Hotel Walton, where most of the sessions were held. The Association was celebrating the fiftieth anniversary of its birth, in the city where it first saw the light in the year 1852, and the attendance was the best in its history and the number of new members the largest it has ever had. It was a joyous and auspicious occasion, full of hope and encouragement for the future of the Association, and one long to be remembered by those fortunate enough to be present.

FIRST SESSION—MONDAY AFTERNOON, SEPT. 8, 1902.

The first general session was called to order at 3:25 p. m., in the convention hall of the Hotel Walton, on Broad Street, with President Henry H. Whelpley, of St. Louis, in the chair. President Whelpley said:

Members of the American Pharmaceutical Association, Ladies and Gentlemen:

I have to-day called to order the American Pharmaceutical Association, which is now crowned with the full fruition of fifty years of useful labor. May this meeting be of such a character that when we adjourn we shall do so with the knowledge that, of all the fifty annual meetings of the Association, the fiftieth and last meeting here in the city of its birth was the best. We will now listen to an address of welcome from his Honor, the Mayor of Philadelphia, Mr. Samuel H. Ashbridge.

Mayor Ashbridge was greeted with applause as he came to the rostrum, and spoke as follows:

Mr. President, Ladies and Gentlemen:

I appreciate the honor conferred in being invited here to meet you to-day and saying a few words of cordial welcome to the city of Philadelphia, and I want to express my

profound satisfaction in having the opportunity to do so. I am not unmindful of the fact that, as your President has just expressed it, in this city just fifty years ago this great Association was organized—this great national Association, with its representatives now in every State and Territory of the Union, which from its modest incipency has grown to such large proportions, like the great drug, chemical and medicinal preparation houses in these United States. We are indeed proud of our old establishments, where not only chemicals, but medicinal preparations were first manufactured and sold almost throughout the length and breadth of the country; and we have these establishments with us to-day, and they have kept pace with the times and are furnishing these so-much-desired articles for the protection of life and its restoration to the people of the country.

We have many things to be proud of in our city in addition to the organization here of this magnificent body, so beneficial and so promotive of the great interests of our country. Here occurred many of the events in our country's history that so appeal to the manhood and patriotism, not only of Philadelphians, but of all citizens of the nation. The great Magna Charta of American liberties, the Declaration of Independence, will be shown you, as well as old Carpenters' Hall, where Congress first met, and Independence Hall, whence went forth the peal of liberty, the thrilling story of which is told every boy and girl in school, and which lives in the hearts of every man and woman in the land. And while we may come from many nations and speak different tongues, we are all agreed that, in this country, there is but one citizenship, and that the noblest of them all—American citizenship! [Applause.]

I, therefore, cordially welcome this great Association to this city, not trusting and hoping, but believing that your deliberations here will be fruitful of splendid results in promoting the cause of humanity and advancing the interests of the Association along its years of future usefulness.

To the ladies I beg to say, that the committee on entertainment, as I understand, have made many arrangements to show them around the city. While we are not a boastful people, I hope I may be permitted to say that we have a domestic, social, moral life in our midst that appeals to the higher sensibilities and admiration of the race. Without detracting from any other city on this continent, I think I can safely say that it is practically the only city in the world where mothers and daughters and sisters can walk about and go to the theaters and to social entertainments without the necessity of a male escort. [Applause.] Such is the moral plane of our people, the manhood of its men and the virtue of its women! The high moral atmosphere in which we live is something in which we take a great deal of pride.

Here have been projected many great commercial enterprises; manufacturing plants and the best genius of development are to be found here.

Again permit me to say, that when you go home, may you find that your visit to Philadelphia has been fruitful of much benefit; may your members individually, and the ladies who accompany you, be so well pleased with your stay in this city, that when you go hence to your homes you will carry with you recollections of your visit that will remain with you for many years to come, and with the feeling that no city in the country could have extended you a more cordial and hearty greeting than the city of Philadelphia. [Great applause.]

THE PRESIDENT: We have heard with pleasure these hearty words of welcome on the part of the city of Philadelphia. Now for the drug trade and allied interests, Mr. M. N. Kline will speak to us.

Mr. Kline then spoke as follows:

Mr. Chairman, Ladies and Gentlemen:

It devolves upon me to add to the welcome which his Honor, the Mayor, has already

extended to you, by saying a word on behalf of the local druggists—possibly you might better say, the local committee of arrangements. I want to say at the outset, in their behalf, that we are most heartily glad to have so many of you here present with us at this meeting of this great organization, of which all of us who are thorough pharmacists, or connected in any way with business having to do with pharmacy, are so justly proud. It is always an honor to Philadelphia to have meetings in her midst of organizations such as this, and as his Honor the Mayor has just said, many such organizations have seen fit to meet in this city. I think at the present—during this week—there are five different organizations meeting in Philadelphia. Of course, as you already fully appreciate, it is especially fitting that an organization like this should hold its fiftieth anniversary meeting in the city of its birth. Fifty years have passed since the organization was formed in this city. Very much has been accomplished, as you all know, in the direction for which the organization was formed; and we believe, with your president, that, dating from the present meeting, new interest will probably be given the work which you have in hand. It is fitting, I say, that you should come back to the place of your birth and celebrate your fiftieth anniversary here in Philadelphia. I need hardly remind you that, not only was the place of your first meeting here in Philadelphia, but that here you elected from among her citizens your first president. I need not remind you that here, too, if I am not misinformed, was organized the first school of pharmacy in this country. It was here that Wood and Bache acted as professors of materia medica and chemistry, respectively, in the first school of pharmacy. It was here that those men, whose memory lives in the minds of every one present—Procter and Parrish—lived and did their work. These are men that you as members of the American Pharmaceutical Association and we as citizens of Philadelphia are justly proud of. And so it is fitting and proper that the local drug trade of the city in general, and the committee in particular, should welcome you to our midst, and bid you make your sessions just as profitable as possible. But while we bid you do this with great sincerity, we bid you furthermore to enjoy that feast of good things in the way of entertainment which the local committee has provided, both for yourselves and the ladies present, during the coming week. We trust that your stay in this city may be profitable and pleasant, and that when you leave us, a week from now, you will carry with you the same pleasant recollections of the City of Brotherly Love that I am sure have characterized every meeting that has ever taken place in our midst. [Applause.]

THE PRESIDENT: The Philadelphia Retail Druggists' Association is represented by its president, Mr. Warren H. Poley, who will now extend a welcome to us on behalf of that organization.

Mr. Poley was applauded as he came forward, and said :

Mr. President and Members of the Association: Three or four years ago, in this city, there was born an infant relative of this Association, the Philadelphia Association of Retail Druggists—the P. A. R. D. This infant, in spite of soothing syrups and pap administered by the wholesalers and manufacturers, grew lustily, and is now a great, big, overgrown youth, representing 550 out of the 700-and-odd retail druggists in this city. On behalf of this Association,—I might say on behalf of the entire retail trade, which I think is represented at this meeting here,—I want to bid you welcome to our city. I take it for granted your stay in Philadelphia will be profitable from a scientific and professional point of view, but we are very desirous that you have a good time socially as well, and that you carry away with you—as Mr. Kline has said—a pleasant recollection of Philadelphia. As a special feature of entertainment offered to you by the entire retail trade, through our Association, I want to ask you all to our steamboat excursion on Friday. We expect to meet you all there and have a good time with you, and we want

you all to enjoy yourselves very much. We want you to remember that the city is yours, and the fullness thereof. Anything that you want, just take it. You have the Mayor here on your side, and you can do anything you please. [Applause.]

THE PRESIDENT: But few of us are total strangers to this great city and its good citizens. We heartily appreciate the kind words of welcome that have been spoken, and I will call on a fellow-member of this Association, Mr. William C. Alpers, of New York, to express the feelings of the Association for the great eastern division of our country.

Mr. Alpers was heartily applauded as he came forward, and spoke as follows:

Mr. President, Ladies and Gentlemen, and Members of the American Pharmaceutical Association:

In selecting me, a poor, struggling retailer, as the first man to reply to the addresses of welcome—one of which was delivered by a powerful, prosperous wholesaler—I am sure our President, with a twinkle in his eye, wished to emphasize right at the start the contrast that exists between the retail and the wholesale trade, and I trust that this contrast will be sufficient apology if the duty devolving upon me does not fully meet your expectations.

Coming to Philadelphia yesterday my train stopped a little distance outside of the city, giving me a chance to look out of the windows on both sides, and I had two distinct impressions, which I believe will remain with me for a long time. Looking out of one side of the car I saw a long fence, and painted on this fence in gaudy colors was a big sign, or advertisement. It represented a boy, seemingly embarrassed and “seedy-looking,” with a package in his arm, out of which he was spilling something—*baby food*, I imagined—that he had bought from the wholesaler (laughter); and a number of geese—a long string of them—devouring the stuff that he spilled. I looked at the sign contemplatively, and thought to myself these Philadelphians are not as slow as they are made out to be. [Laughter.] There they have placed on that fence, apparently as a sort of object lesson for the incoming members of the American Pharmaceutical Association, a picture of the whole status of pharmacy in this country. The embarrassed boy is the pharmacist, who gets his goods from the proprietary man or the wholesaler, only to spill them on the ground for the geese, the public, to eat them up, leaving him nothing for his labor. [Great laughter and applause.] Oh, I did feel like getting out of the car and kicking that boy! I felt like telling him to either hit the geese on the head and make them pay for the food they were devouring, or throw it back at the wholesaler. [Laughter.]

This was one impression. Then I looked out of the window of the car on the other side, and there I saw against the blue of the sky the distant statue of William Penn, towering high on its majestic pedestal of the summit of your great City Hall above the houses of Philadelphia, and I could not help thinking that the man whose statue I saw there was also a true representative of pharmacy as it should be—in character, a type of what we should do and how we should act. If there was one lesson that man taught us it was, to live together in brotherly love and to depend on our own resources alone to succeed.

These two impressions that I had, one humorous, the other serious, have their lesson for us. I hope that, on the one side, we will enjoy our stay here, and that, in the darker moments of life, we will remember that oftentimes the good joke, the jolly story, is the best tonic the druggist can take; on the other hand, that we shall not forget that, to free ourselves from the many difficulties under which we labor to-day, we should live together in brotherly love and dependent alone upon our own resources. I trust these two thoughts will prevail during our meeting.

To enter into detail as to the pleasant and cordial greetings of the gentlemen who have addressed us is not necessary. Philadelphia is too well known for that. Its many historic reminiscences, which, I believe, will be dwelt upon by more eloquent speakers than I am, its beautiful parks, its grand buildings and streets, and above all, the liberality and generosity of her sons and the beauty and virtue of her daughters, will combine to make this, I am sure, the visit of our lives; and if any one could doubt this, the friendly words of greeting from the Mayor and the Committee should dispel the thought. Gentlemen, in the name of the druggists of the East, I thank you most heartily. [Great applause.]

The President called on Mr. E. G. Eberle, of Dallas, Texas, to respond for the Southwest, and he spoke as follows :

Mr. President, Ladies and Gentlemen :

I tried to persuade President Whelpley to let me off from making a speech for two reasons: in the first place, I am not a speaker; secondly, I come from Texas, and he has asked me to speak for the Southwest, when, if you take Texas out of it, there is not much left. [Laughter.] When a Texan gets away from home, where he thinks you don't know all about Texas, he is rather inclined to brag and say big things about his State. For instance, to come this far to a meeting he would say is going no great distance—no further than from one side of Texas to the other; just a little side-trip. The State of Texas is a wide expanse of open prairie and continual sunshine, and it is but natural that we who live down there should feel free and open-hearted, and should welcome the stranger in our gates. The great expanse of our State makes it but natural for everything with us to be on a broad scale—both our fortunes and our misfortunes are of great proportions. We undertake to do nothing by halves. When we have a flood, we drown half the people. When we strike oil, we don't stop to pump it out like you people up here, we get a "spouter" and let it "blow" out. [Great laughter.] Now, Texas being the greater portion of the Southwest, we all have that broad, hospitable, generous, kindly feeling. We love to have people come down there, and we love to entertain them. We do it because we love to do it; and the State and the people who do entertain and have this hospitable feeling cannot help but be appreciative when the glad word of welcome is spoken to them, and the hospitable hand extended to them in brotherly love and affectionate regard.

There is very little to say in regard to receiving the cordial welcome that has been extended us. The most we can do is to say we are thankful for the kind greeting, and to show by our acts that we appreciate the kind welcoming words that have been spoken. So, on behalf of the great Southwest, including the great state of Texas, I thank the members here from the city of Philadelphia for their cordiality and hospitable greeting. (Applause.)

The President called on Mr. William A. Frost, of St. Paul, to respond to the words of welcome spoken for the Northwest, and that gentleman spoke as follows :

Ladies and Gentlemen :

I asked our President to excuse me, but he said as there was no other representative here from the Northwest, he was obliged to take the best he could get. So he had to take me, and I had to agree to speak.

This Association is fifty years old, and many of us think fifty years is a very short time. When we look back over fifty years, many of us think that; but when we take into consideration the things that have been accomplished in that length of time, they often seem

long years. I come from a section where, fifty years ago, there was hardly any sign of civilization. To-day there are busy wheels of commerce and manufacture, and mills grinding out the wheat of its broad, expanded wheat fields, that are counted in acres by the thousands, and which supply enough wheat to furnish almost half of this great country with food.

For the Northwest, I wish to thank the committee for their hospitable expressions, and to say that I am sure we shall enjoy our stay among you. (Applause.)

THE PRESIDENT: Fellow-members of the American Pharmaceutical Association, you have elected me to preside over a meeting of unusual interest and phenomenal in attendance. I fully appreciate the responsibilities which rest upon me, and in order to have good and efficient support near at hand, I invite all the ex-Presidents to seats upon the rostrum. The General Secretary will read the list of living ex-Presidents of the Association, and I will ask them to kindly come forward and take seats upon the rostrum as their names are called.

The Secretary read the list and the following-named ex-Presidents came forward, amid the applause of the convention, and took seats upon the platform, presenting a living picture, so to speak, of the historic past of the Association, and lending great dignity and impressiveness to the session :

William J. M. Gordon	Cincinnati	1864.
Enno Sander	St. Louis	1871.
Albert E. Ebert	Chicago	1872.
John F. Hancock	Baltimore.....	1873.
C. Lewis Diehl.....	Louisville.....	1874.
George W. Sloan.....	Indianapolis	1879.
James T. Shinn.....	Philadelphia	1880.
John Uri Lloyd	Cincinnati	1887.
Joseph P. Remington	Philadelphia	1892.
Edgar L. Patch.....	Boston	1893.
William Simpson.....	Raleigh, N. C.	1894.
James M. Good	St. Louis	1895.
Henry M. Whitney	Lawrence, Mass.....	1897.
A. B. Prescott.....	Ann Arbor, Mich.....	1899.
John F. Patton.....	York, Pa.	1900.

Thus there were fifteen out of twenty-one living ex-Presidents of the Association gathered about President Whelpley; the absentees being as follows :

Frederick Stearns.....	Detroit.....	1866.
Ezekiel H. Sargent	Chicago	1869.
William Saunders	London, Can.	1877.
A. K. Finlay.....	New Orleans.....	1891.
Joseph E. Morrison.....	Montreal, Can.	1896.
Charles E. Dohme.....	Baltimore.....	1898.

Ex-Presidents Sargent, of Chicago; Saunders, of Canada, and Dohme, of Baltimore, afterwards arrived and took part in the deliberations of the Association.

The President called First Vice-President W. M. Searby, of San Francisco to the chair while he read his address, which was as follows :

THE AMERICAN PHARMACEUTICAL ASSOCIATION IN 1902.

BY PRESIDENT H. M. WHELPLEY, ST. LOUIS.

My address was written with a view of contributing to the semi-centennial volume of Proceedings a document of some historic value—a record of the American Pharmaceutical Association as we find it at the close of half a century of existence.

This necessitated the introduction of many statistics and other matter too dry for reading on an occasion of this kind. This led me to make an abstract of the rather lengthy document. This I will now read, and leave the complete message for the kind consideration of the Committee on President's Address and for publication in the proceedings.

THE A. PH. A. HAS MADE FIFTY YEARS OF HISTORY.

"To-day is yesterday's pupil."

The Fiftieth Anniversary of the American Pharmaceutical Association is here, and we meet to transact business which fifty years have made routine.

Even the youngest among us are deeply impressed with mingled sentiments of wonder and gratitude on this exceptional occasion. We wonder at the enlarged sphere of action and progress made by our beloved Association during the first half century of its life. We are grateful for the privilege of holding a semi-centennial convention in the home of our Association's birth—the great metropolis where were established the first college of pharmacy and the first pharmaceutical journal in America.

Custom and propriety call for an address from the chief retiring officer. A careful perusal of the forty-nine volumes of Proceedings reveals the fact that presidents of this Association have closely followed each other in the selection of the nature of subjects for consideration. This is but natural, and it is no wonder that the same topics have been discussed more than once by my predecessors.

Far be it from my purpose to depart from these lines of conventionality at this historic period in our existence, but I feel that this is a time when the President's address should link the past with the present, and I will frequently refer to our interesting and useful volumes of Proceedings. I do not believe that I was elected with a view of delivering an elaborate address or reading a scientific essay. In fact, the scientific advancement of pharmacy and collateral branches is so carefully reviewed by our able reporter on "The Progress of Pharmacy," that I would not attempt a dissertation on the subject at this time.

THE READING AND DISCUSSION OF PAPERS.

"In consultation there is wisdom."

A careful examination of the minutes of the meetings of State Pharmaceutical Associations held during the past decade reveals unmistakable evidence of a gradual decrease in the number of papers presented each year. I also find that many of the documents are presented in abstract, or read only by title.

Papers have been presented at the annual meetings of this Association during the past ten years as follows :

Year	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901
Number of Papers	36	42	58	41	35	32	63	27	36	58

These figures show quite an increase in the number of papers, and I believe that the large number received by this Association last year is indicative of what we may expect in the near future. The tendency to omit papers from the programmes of the State

meetings and to send them to the American Pharmaceutical Association is avowedly encouraged by some of the State Associations.

This unmistakable trend, which is pointed out by something greater than a straw, renders it very advisable that we adopt every practical means to properly receive and care for all desirable communications. I feel that much valuable time is wasted in the reading of papers. It does not help the Association nor does it benefit the author to encourage the mockery of pretending to listen to a paper when, on account of the nature of the subject treated, it is quite impossible to follow the reader. The only commendable object in having an author read a paper before it is published is to have the subject thoroughly discussed. The vast majority of papers serve their best purpose when published in journals and in the Proceedings, where they can be read in the quiet of home, far away from the excitement of convention week.

I realize the herculean nature of the task which would be imposed upon a committee or officer required to decide just which papers should be read and to select the ones to be published without being read; but I believe the time will come when rules can be formulated to meet this condition.

For the present let us improve conditions by publishing, for distribution at the annual reunions, a program giving an abstract of each paper. This will encourage discussion, and in some cases avoid the necessity of reading the entire paper. I direct your special attention to the program and abstracts of papers published by the Section on Therapeutics, Materia Medica and Pharmacy of the American Medical Association.

OUR NUMEROUS PRIZES.

"He plays well that wins."

It is true that we do not make annual awards of all of the prizes offered by the Association, but the extensive list is as follows:

Ebert Fund, interest on \$765.32.

Hermann Hager Memorial Prize, \$50.00 net.

John M. Maisch Prize, \$50.00 net.

Enno Sander Prize, \$50.00 net.

First General Prize, \$50.00 net.

Second General Prize, \$30.00 net.

Third General Prize, \$20.00 net.

Centennial Fund, interest on \$1,619.15, available for defraying expense of original investigations

The judicious awarding of special prizes is not a difficult task, but it taxes the judgment of our best members to determine the just distribution of the general prizes. The range of subjects covered by the competing papers is very great, and many of the documents require expert training in special branches of science in order to pass upon them in a competent manner.

I believe that I reflect the sentiment of those who have served upon the committees on general prizes when I say that it is quite impossible to render decisions with a full assurance that the awards are always fair and just.

THE UNITED STATES PHARMACOPŒIA.

"Books must follow sciences, and not sciences books."—*Bacon*.

The U. S. P.—It was not until 1890 that the convention for the revision of the United States Pharmacopœia recognized delegates from our Association, but American Pharmaceutical Association members have long taken an active part in the work of revision. They have constituted a majority of each committee of revision during the past forty years. At the 1900 meeting of the United States Pharmacopœial Convention about three-fourths of the persons elected to office, or on the committee of revision, were members of this Association. The list is as follows: Prescott, Wall, Whelpley, Thompson, Dohme, Ebert, Sheppard, Sloan, Rice, Remington, Caspari, Coblentz, Diehl, Good, Gregory, Hallberg, Kraemer, Kremers, Lyons, Oldberg, Payne, Sadtler, Sayre, Scoville, Squibb, Stevens. This is certainly a good showing when we remember that the conven-

tion is composed of delegates from incorporated medical as well as pharmaceutical organizations.

THE NATIONAL FORMULARY.

"Wondrous, indeed, is the virtue of a true book."

The National Formulary was placed on the market by the American Pharmaceutical Association in 1888 and revised in 1895. The second revision is now in progress at the hands of a committee under the chairmanship of Conrad Lewis Diehl, who will submit a report at this meeting. The National Formulary has been of much service to the retail drug trade, and contributed considerable pecuniary profit to this Association. The work deserves our continued hearty support.

NATIONAL LEGISLATION.

"Law is the wisdom of all ages."—*Butler*.

The Convention of 1851, which led to the organization of this Association in 1852, met with no great difficulty in improving the importation laws and rules relating to the admission of drugs into this country. This success opened the way for continued work for better national legislation on subjects of interest to our members and the public.

Educated pharmacists have very properly, a voice in solving problems of a national character. In every department of applied science the acknowledged expert is replacing the dictation of mere opinion and the autocratic rule of thumb in legislative matters.

The Metric System.—Reformation is a work of time, and, like charity, must begin at home. It has been said that he who reforms himself has done much towards reforming the public. Thanks to our colleges, authors and journals, the pharmacists of the United States are well versed in the use of the Metric System.

The eighty millions of citizens in this country cling to the inheritance of an old and cumbersome system with a tenacity born of many generations. It is to the pharmacist's credit that he discards obsolete customs and is found in the advance ranks of reform.

In 1865 Congress authorized the use of the Metric System. The action was due, in a measure at least, to the thorough exposition of the system set forth in a paper published in the Proceedings of the American Pharmaceutical Association for 1859 (see page 115).

Our interest in national legislation on this subject continues, and the Standing Committee on Weights and Measures, with Frank Gibbs Ryan as chairman, is speeding the day when the Metric System will be the only one in use in this country.

The tax on alcohol.—The high rate of tax on alcohol imposes either a direct or indirect burden upon every branch of pharmacy by increasing the expense of our products. While it is not possible, nor perhaps best, at this time to secure a repeal of the entire tax, it is very desirable to have it reduced. The Joy bill, having this object in view, will come up for action during the first week of the next session of Congress.

A MODEL PHARMACY LAW.

"The good need fear no law."—*Massinger*.

One of the many perplexing problems under consideration by the thinking pharmacists of this country is that of arranging for general reciprocity between the various State, Territorial and City Boards of Pharmacy.

Proprietors as well as clerks find occasion to move from one State to another, and meet with great annoyance, as well as considerable expense, in re-establishing their right to follow their life occupation.

This Association has, after continued work and careful consideration, adopted the James Hartley Beal draft of what we are pleased to term a model pharmacy law. If the laws of the several States and Territories are amended to conform with the main features of the model law, the Boards of Pharmacy can soon work out a feasible plan for the interchange of certificates of registration.

Associations are prone to shield themselves behind resolutions adopted by the votes of the small percentage of the membership which is in attendance at the convention. The American Pharmaceutical Association has adopted a model pharmacy law, and let us now follow up its adoption with such energetic action that proper results will crown our efforts.

The medical profession is facing a similar condition of lack of inter-state legislation, and its members are equally anxious to establish a plan that will practically amount to national medical registration. We may be able to confer with them and profit by their experience.

IMPROVE THE QUALITY OF APPRENTICES AND THE CONDITIONS OF APPRENTICESHIP.

"As the twig is bent, so the tree inclineth."

The broad field of pharmaceutical education in 1902 embraces many problems which are new and peculiar to the present day and generation. We must not permit the newcomers to obscure the real foundation of the education of those who are to be our successors as the compounders and dispensers of medicines.

The retail pharmacist has it in his power to eliminate ignorant men from our calling. Let him select as apprentices only such boys and girls as are by previous education and natural endowment ready for the training of apprenticeship, and who will become suited to and satisfied with the exacting duties of a responsible, but not very remunerative, calling.

The growing tendency to enter the college of pharmacy before gaining drug store experience shifts some of the responsibility upon this class of institutions. The qualifications for entering college should pertain to the life-work of the matriculant as well as meet the demands of the college course.

In order to show that my suggestions are in keeping with the early work of this organization, I quote the following from an address, "To the Pharmacists of the United States," issued by the American Pharmaceutical Association in 1854 (see Proceedings, Volume IV, page 4) :

"The American Pharmaceutical Association, deeply impressed with the importance of adopting some measure by which the present and future apothecaries of this country may be improved in educational standing, viewed in reference to the practice of their profession, have determined to address their brethren everywhere in our widely extended country, believing that some good results may arise from the hints they will suggest. By an inquiry extended to all sections of the Union, it has been ascertained that a vital defect exists in the very budding process of pharmaceutical education—the apprenticeship."

PHARMACISTS IN THE GOVERNMENT EMPLOY.

"Honor is purchased by deeds we do."—*Marlowe*.

Pharmacists in the public service of the United States rank lower than in any other civilized country save one. This condition continues to exist in spite of the several years of energetic, persistent and well-directed work of the American Pharmaceutical Association Committee on Status of Pharmacists in the Army, Navy and Marine Hospital Service of the United States.

The Navy.—But the labor has not been entirely without results, for, since the appointment of the committee, the naval apothecary has been raised from a rank next to the negro cook to one next to a commissioned officer. His former salary of \$60.00 per month may now reach \$2,000 per year. His new title is that of Naval Pharmacist.

The Marine Service.—The harsh, grating title of Marine Hospital Steward has given place to that of Marine Hospital Pharmacist, and he is now on the civil service list and cannot be discharged without cause. A small advance in salary has also been secured in this service. The appointment of a government pharmacologist and a pharmaceutical chemist at good salaries is worthy of note.

Our Committee.—The cause of justice must eventually win, and we are fortunate in

having had the optimist, George Frederick Payne, as chairman of this committee since its creation in 1894. Let us continue the work until leading pharmacists in the United States' employ may reach the rank of Brigadier General, as some pharmacists now do under the republic of France.

Government Delegates to the American Pharmaceutical Association.—The Army, Navy and Marine service are represented annually by delegates to the American Medical Association. This custom contributes to the advancement of medicine. Our Association holds a similar relation to those departments of our government, and I feel that we should invite these departments to be officially represented by delegates of pharmacists.

THE UNITED STATES DEPARTMENT OF AGRICULTURE AND THE INVESTIGATION OF THE ADULTERATION OF DRUGS.

“Serenely pure, and yet divinely strong.”

I am informed by Dr. H. W. Wiley, Chief of the Bureau of Chemistry of the United States Department of Agriculture, that, under the authority of Congress, the Bureau is about to begin an investigation of the adulteration of drugs in the United States.

The chief of the Bureau has invited your president to outline what he considers should be the character and scope of this examination. I am assured that the office desires the collaboration of our Association, including all suggestions that may be made by its officers and members.

Inasmuch as the American Pharmaceutical Association was founded with the prime object of improving the quality of drugs imported into this country, I believe that we should thoroughly discuss the subject at this meeting.

THE EXHIBITS.

“What it shows and what it teaches
Are not things wherewith to part.”—*Jean Ingelow.*

The exhibition feature of our meetings reappeared last year in a revised and improved form. The committee under the chairmanship of Joseph Price Remington brought about a new order, and the Association now has full control of the nature and extent of each exhibit. The firms represented are given adequate recognition in the special session of the Association devoted to the discussion of exhibits. The Association receives financial gain in addition to the increased attendance and other benefits arising from this feature of the meetings.

In commending the exhibits, I call special attention to the historical display. This can be made of real service in a branch of American pharmacy which has been much neglected.

PROMPT PUBLICATION OF THE PROCEEDINGS.

“Let your haste commend your duty.”—*Shakespeare.*

For more than forty years various officers and members have urged the early publication of the Proceedings. I feel fully justified in continuing this unremitting appeal. The ideal time is to have the volume in the hands of the members while the meeting is fresh in the memory of those who attended and is still echoed by the pharmaceutical press.

But the character of the work itself makes it quite impossible to issue the volume with uniform promptness. Our impatient members must remember that while “delays may be dangerous,” greater accuracy is frequently secured.

The Association is not in a financial condition to demand the undivided time of a General Secretary. The amount of proof reading necessary is simply stupendous and comes at a busy season of the year, in addition to the routine work of the office.

The Proceedings for the coming year will be an unusually large volume and will necessitate strenuous efforts on the part of all concerned if it is to be issued promptly. This, the semi-centennial, is the year of all years when the members will impatiently await the publication of the proceedings.

THE SIZE OF THE VOLUME OF PROCEEDINGS.

"A drop of ink makes millions think."

Only a limited number of pages were required to accommodate each of the first few volumes of the proceedings. The report of the seventh annual meeting, however, occupied 488 pages. This number has gradually increased until we reach more than 1000 pages in recent volumes.

The question of dividing the report into two volumes is a matter for future consideration. But it is now time to urge members to cultivate a style of writing which combines brevity and compactness without sacrificing clearness.

We must commend the zeal of our officers and committees in encouraging the contribution of papers and extending the discussions. It is reasonable to expect that our growing membership and developing Sections, together with the general literary activity among pharmacists, will swell the size of future proceedings.

A GENERAL INDEX TO THE PROCEEDINGS.

"Get a thorough insight into the index, by which the whole book is governed."

A good general index is absolutely necessary to render any volume or set of books useful for reference. Four general indices to the proceedings have been published. They appeared as follow: In Volume X (1862) for Volumes I to VIII; in Volume XIX (1871) for Volumes IX to XVII; in Volume XXXII (1884) for Volumes XVIII to XXX; in Volume XXXIX (1891) for Volumes XXXI to XXXVIII.

It was originally contemplated that an index be published at the close of every decade. It was suggested in 1890 that the index due in 1900 should include all of the volumes published since the organization of the Association. Such a general index, covering the work of almost half a century, will render the entire set of proceedings more valuable. Would it not be well to have the index also include the years 1901 and 1902, and henceforth issue the decennial indices at the close of each decade of our Association?

An index to fifty volumes.—I feel that an index to the proceedings of this Association for fifty years will form a separate volume at once useful and a fitting souvenir of our semi-centennial anniversary.

THE PUBLICATION OF PICTURES OF MEMBERS IN OUR PROCEEDINGS.

"As silent as the pictures on the walls."—*Longfellow*.

Those who attend the annual meetings find that each volume of proceedings, in addition to being a valuable work of reference, holds personal associations which revive in memory the pleasant occasion which it records.

At irregular intervals we have published, as frontispieces to the proceedings, pictures of some one or two deceased members whose labors have won for them the esteem of the pharmaceutical profession. The following is a list of the members whose memory we have thus honored:

1874—William Procter, Jr.
1875—Edward Parrish.
1876—John Milhau.
1877—Charles T. Carney.
1878—Ferris Bringham.
1879—Eugene L. Massot.
1880—William F. Chapman.
1881—Charles W. Badger.
1882—George W. Andrews.
1883—William Neergaard.

1884—Daniel B. Smith.
1885—Henry B. Parsons.
1886—Edward S. Wayne.
1890—Emlen Painter.
1893—John M. Maisch.
1896—Charles O. Curtman.
1898—Alfred B. Taylor.
1898—Maurice W. Alexander.
1901—William S. Thompson.

The present perfection of mechanical art enables us to publish a speaking likeness at a very nominal expense. May we not add to the permanent value of each volume of pro-

ceedings by having it contain the picture of some worthy member who has finished his good work among us?

PLACES OF MEETINGS.

"All traveling has its advantages. If the passenger visits better countries, he may learn to improve his own; and if fortune carries him to worse, he may learn to enjoy his own."

When selecting the location of a meeting, we should remember that nothing tends so much to enlarge the mind as travel. Our conventions render the members real service by taking them away from the towns, cities or countries in which they were born, educated, or have followed their calling. I surmise that the framers of our constitution had this in mind, for article 1 of section 4 of the by-laws, adopted October 6, 1852, reads as follows (see Proceedings, Volume 1, page 24):

"The meetings shall be held annually, at such time and place as shall be determined at the adjournment of the previous meeting, observing that no two meetings shall be held consecutively at the same place."

A few years later a member urged the other extreme, and the association considered the advisability of adopting a permanent meeting place (see page 12 of Proceedings for 1860), and Washington was much in favor with those advocating the plan. But the migratory spirit ruled the day, and has been productive of much good.

During the fifty years the Association has met in thirty places, and only ten of them have been visited more than once and five of them more than twice. The list is as follows:

<i>No. of Meetings.</i>	<i>Place.</i>	<i>Date.</i>
6.....	Philadelphia .	1852-57-62-68-76-1902
4.....	Boston	1853-59-65-75
4.....	Baltimore.....	1856-63-70-98
3.....	Cincinnati	1854-64-87
3.....	New York	1855-60-67
2.....	Washington, D. C.	1858-83
2.....	Detroit	1866-88
2.....	Chicago	1869-93
2.....	St. Louis	1871-1901
2.....	Richmond	1873-1900
1.....	Cleveland.....	1872
1.....	Louisville	1874
1.....	Toronto	1877
1.....	Atlanta	1878
1.....	Indianapolis	1879
1.....	Saratoga.....	1880
1.....	Kansas City	1881
1.....	Niagara Falls....	1882
1.....	Milwaukee	1884
1.....	Pittsburg	1885
1.....	Providence	1886
1.....	San Francisco.....	1889
1.....	Old Point Comfort....	1890
1.....	New Orleans.....	1891
1.....	Profile House, N. H.	1892
1.....	Asheville	1894
1.....	Denver	1895
1.....	Montreal	1896
1.....	Lake Minnetonka	1897
1.....	Put-in-Bay.....	1899

The American Pharmaceutical Association as a Traveler.—I have the estimate of a railroad official that during the past half century the American Pharmaceutical Association has traveled 44,236 miles in going from one place of meeting to another.

The Association has visited the various States as follows:

Pennsylvania	7	New Hampshire.....	1
New York.....	5	North Carolina	1
Ohio.....	5	Georgia.....	1
Maryland	4	Kentucky	1
Massachusetts	4	Indiana.....	1
Virginia	3	Wisconsin	1
Missouri	3	Minnesota	1
Michigan	2	Louisiana	1
Washington, D. C.	2	Colorado	1
Illinois	2	Rhode Island	1
Canada	2	California	1

We have evidenced a decided preference for cities as meeting places. Not until the 1880 meeting at Saratoga did the Association convene at what is termed a pleasure resort; nor have we repeated the experiment more than half a dozen times. The general sentiment, however, now seems to be in favor of such places.

Not all meetings in the United States.—Twice has the Association crossed the border and met in Canada. It is not at all improbable that we shall, before many years, visit Mexico, Cuba, Porto Rico and, possibly, the Hawaiian Islands.

OUR ENTERTAINMENT PROGRAM.

"We are all children in our strife to seize each petty pleasure, as it lures the sight."—*Mrs. Hale.*

The social and general entertainment spirit became manifest during the early meetings of the American Pharmaceutical Association. It was not extended a unanimous welcome at that time, for one of the fathers of American pharmacy introduced the following resolution, which was adopted by the 1855 convention (see page 12 of Proceedings):

WHEREAS, The members of this Association, who meet annually to transact its business and forward its objects, have generally no leisure for pursuits not immediately connected therewith;

Resolved, That as a body we decline to advance any convivial or other entertainments, and esteem it important as our members increase to prevent the practice of the last three years, in this respect, from being considered a precedent for the future.

In 1859 the subject again came up for discussion, and I find the following resolution (see page 36 of Proceedings) discussed at length and referred to the 1860 convention:

WHEREAS, The generous hospitality of the members of this Association, resident in the several localities at which meetings have been heretofore held, has been extended into an habitual degree of extravagance which has occasioned uneasiness among some members of the Association, especially in view of the migratory character contemplated in its organization; therefore,

Resolved, That we would respectfully deprecate such demonstrations and resolve that hereafter they shall be discontinued, believing that by their continuance we may be prevented from meeting in many places where otherwise we might assemble with very great advantage to ourselves, individually, as well as to the places visited and the Association.

The President, in his address before the 1860 convention, discouraged "expensive entertainments" (see page 12 of the Proceedings), but the above resolution, laid over from the 1859 meeting, came up for vote and was lost.

Since that time but little real opposition has been made to what is now a well-established custom of entertainment at our annual meetings. We are living in an age of strenuous intellectual life. This condition has forced upon us a realization of the fact that a mental diversion is a mental rest. We must not make our annual gatherings occasions of strenuous mental exertion to the exclusion of all forms of amusements.

It has been said that everything, from love to religion, builds itself upon the theory of pleasing somebody. Our entertainment feature certainly does this, and comes very near pleasing everybody. I feel that we can well afford to leave this matter to the good judgment of our local committees on arrangement. Exceeding temerity would characterize the action of any one who could deprecate the entertainment feature at this moment while confronted with the elaborate and pleasing program now before us.

OUR FRATERNAL RELATIONS.

"Hand grasps hand, eye lights eye in good friendship."—*Browning*.

The records of this Association show that we have always encouraged the formation of State, Territory and local organizations. Our members are prominent in the support of the associations of pharmacists wherever found in this country.

It has been asserted that when this Association was formed only five pharmaceutical societies were in operation in the United States, and that four of these were teaching colleges. We now find practically all of the States and Territories supporting Commonwealth associations.

Our Delegates to State Conventions,—The American Pharmaceutical Association has been represented at all of the State and Territory associations which have convened since our last annual meeting. These special representatives have brought before the associations the subject of joining the American Pharmaceutical Association. The local members of our Association have united with them in explaining the benefits of membership. I feel that our long list of new members at this meeting is due, in no small measure, to the good work of such special delegates. Several of them will have reports to make at this meeting. The complete list is as follows:

Alabama, P. C. Candidus, Mobile.
 Arkansas, John B. Bond, Little Rock.
 California, W. M. Searby, San Francisco.
 Colorado, Chas. M. Ford, Denver.
 Connecticut, Chas. A. Rapelye, Hartford.
 Delaware, H. K. Watson, Wilmington.
 District of Columbia, S. L. Hilton, Washington.
 Georgia, Geo. F. Payne, Atlanta.
 Illinois, A. E. Ebert, Chicago.
 Indiana, Leo Eliel, South Bend.
 Iowa, E. L. Boerner, Iowa City.
 Kansas, L. E. Sayre, Lawrence.
 Kentucky, Addison Dimmitt, Louisville.
 Louisiana, F. C. Godbold, New Orleans.
 Maine, E. A. Hay, Portland.
 Maryland, H. P. Hynson, Baltimore.
 Massachusetts, Chas. H. Ball, Holyoke.
 Michigan, H. B. Mason, Detroit.
 Minnesota, Wm. A. Frost, St. Paul.
 Missouri, Paul L. Hess, Kansas City.
 Montana, Howard Rockefeller, Butte.

Nebraska, C. R. Sherman, Omaha.
 New Hampshire, S. Howard Bell, Derry Depot.
 New Jersey, Geo. W. Parisen, Perth Amboy.
 New Mexico, Eduard S. Maguire, Fort Stanton.
 New York, C. A. Mayo, New York City.
 North Carolina, Wm. Simpson, Raleigh.
 North Dakota, H. E. White, Jamestown.
 Ohio, Wm. R. Ogier, Columbus.
 Oklahoma, Frank A. Dinkler, Hennessey.
 Oregon, Geo. C. Blakely, The Dalles.
 Pennsylvania, John F. Patton, York.
 Rhode Island, M. B. Wood, East Providence.
 South Carolina, Chas. P. Aimar, Charleston.
 South Dakota, D. F. Jones, Watertown.
 Tennessee, A. B. Raines, Columbia.
 Texas, Albert D. Lorenzi, Dallas.
 Vermont, W. F. Root, Brattleboro.
 Virginia, J. Y. MacRae, Norfolk.
 Washington, H. E. Holmes, Seattle.
 Wisconsin, H. T. Eberle, Watertown.

The first state society.—Commencing with the formation of the first State Pharmaceutical Association—that of Maine—in 1867, my predecessors in office have from time to time reviewed the chronological procession of new State societies and colleges of pharmacy. The number has grown until each state and territory now has an association, and colleges are to be found in nearly all of the states.

Our visiting delegates.—We continue the system of inviting delegates to our meetings, although the abolition of the initiation fee and other changes in our constitution and by-laws have long since robbed delegates of all special benefits, save the minor privilege of joining the American Pharmaceutical Association without further endorsement and the slight recognition given by having one's name in the list of attendance designated as that of a delegate. I trust that we may soon correct this condition and give our delegates due recognition.

The N. A. R. D.—Our fraternal relations have extended during the past four years to a sister national organization, the National Association of Retail Druggists, which was formed at St. Louis October 17, 1898. This society limits its territory to the United States, its membership to those actually engaged in the retail drug business, and its scope

to commercial subjects. I feel that the N. A. R. D., like its predecessor, the National Retail Druggists' Association, has joined with state associations in materially aiding the American Pharmaceutical Association.

The National Retail Druggists' Association, organized at Washington, September 10, 1883, and merged into the American Pharmaceutical Association in 1886-7, brought to the front men who are to-day looked upon as pillars in our Association. The now active N. A. R. D. has not only developed latent talent of a national character, but also effected the organization of more than 440 local associations. It is in affiliation with 670 of these smaller societies, which teach the members the value of co-operation and the strength of organization. Many thus become interested in the American Pharmaceutical Association. I could name a number of our new members who became enthused in association work through N. A. R. D. efforts.

The American Medical Association.—Our sister national organization of physicians has a section on therapeutics, materia medica and pharmacy which covers a field of work that can well be considered common territory. In 1890 the Association invited the American Pharmaceutical Association to send a delegation of twenty-five members to its annual meetings. The chairman of our 1902 delegation to that body, Carl Svante Nicanor Hallberg, is secretary of the section, and will submit a detailed report of the status of our cordial fraternal relations with the American Medical Association.

I hope that an increasing number of the American Pharmaceutical Association members will attend the coming annual meetings of the A. M. A. We are not likely to over-estimate the importance of conjoint work in the two callings which go to make up the healing art and the art of preparing healing appliances. The more we mingle with each other the better we will understand the feelings that actuate those who are striving for the common good of medicine and pharmacy.

THE CHARACTER OF OUR MEMBERSHIP.

"Show me a man's associates and I will tell you what he is."

The Personnel.—It was a meeting of nine retail pharmacists in the New York College of Pharmacy, at 511 Broadway, at 5 p. m., October 15, 1851, that led to the convention in Philadelphia, one year later, which organized the American Pharmaceutical Association.

This Association was conceived, and for several years maintained, almost solely, by retail pharmacists. As late as the year 1859 (see Proceedings, page 4) a prominent member reveals the conditions prevailing at that time by expressing a belief that the association would be strengthened by the addition of scientific men.

At the close of half a century we find that our membership list comprises retail pharmacists, teachers, editors, authors, physicians, chemists and other scientists directly or indirectly interested in pharmacy; wholesale druggists, manufacturers of pharmaceuticals, chemicals, proprietaries, and various specialties. Thus we have a "pharmaceutical" association in the broadest sense of the term. Nine men, with but a single idea, that of preventing the importation of adulterated drugs, laid the foundation of this Association. But we have grown a hundred and fifty fold in number and broadly developed in purpose, until we now embrace in our ambition the advancement of every feature of scientific, practical, educational, legislative, commercial and social pharmacy.

Our Present Need.—It is not convenient to further analyze our membership, but from obvious evidence I am convinced that our greatest need at the present time is among the retail pharmacists. We deserve greater representation in the rank and file of the dispensing drug trade. We should seek strength in the very branch of pharmacy for which the Association came into existence.

The Geographical Distribution.—The early history of this Association established the fact that its organizers intended to make it national in fact as well as in name. It becomes our pleasant duty to look back, after having made half a century of history, and

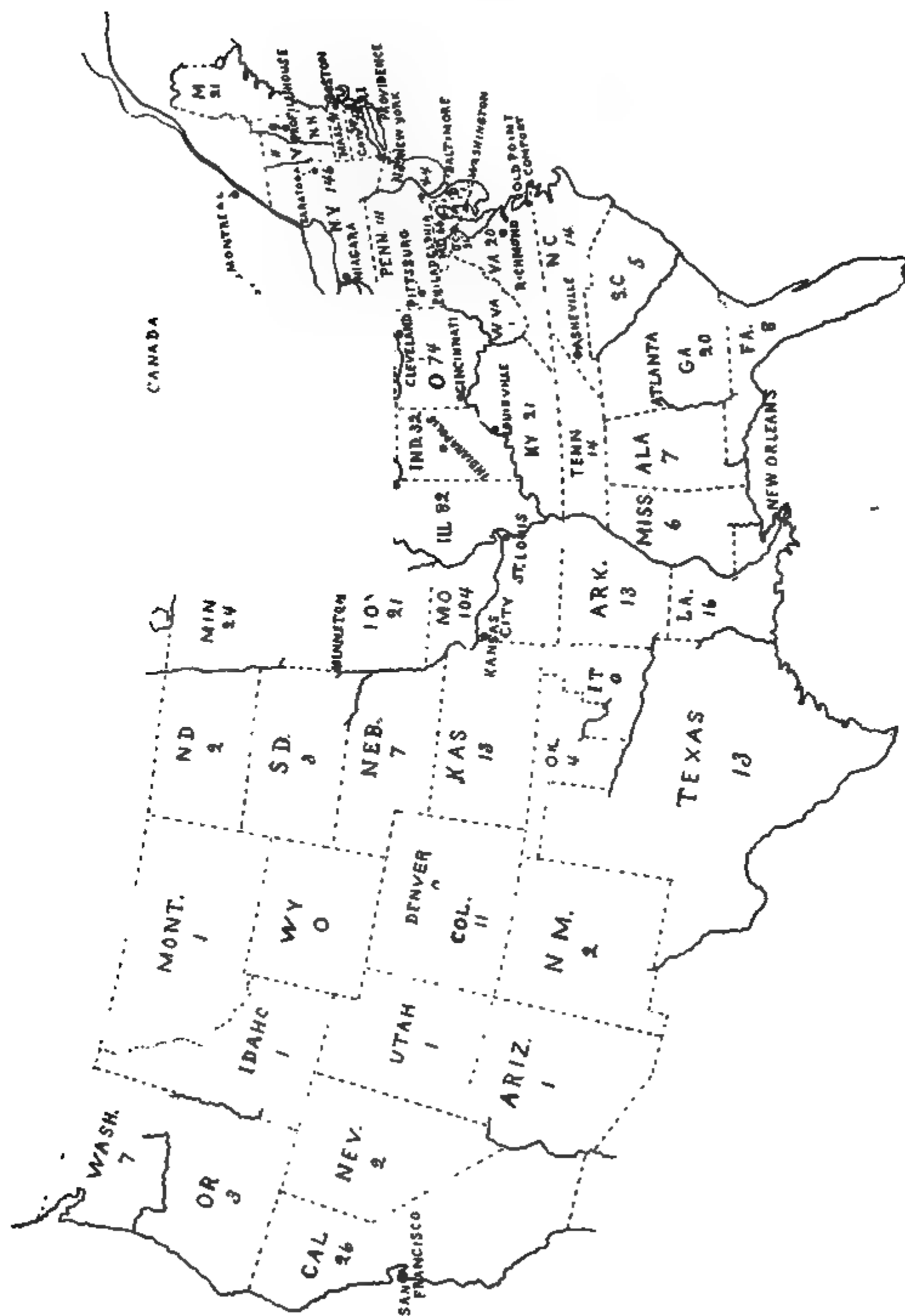
see if we are working along the broad lines laid down in 1852. I find that a committee, composed of William Procter, Jr., Samuel M. Colcord and George D. Coggeshall had the following to say in a report made at the organization convention :

"The number of pharmacists constituting the professional body in the United States is large, comprehends all grades of qualification and extends to every city and town in the country. The professed object of the present convention being to adopt measures calculated to benefit this large body of citizens, in a professional point of view, by showing that there exist many grounds of sympathy between them, notwithstanding the present want of united action, we believe that the institution of a national Association, whose members may come from all sections of the country, is calculated to enlist this feeling of brotherhood and direct its power, as a forming force, towards the elevation of the average standard of qualification now existing."

This country has grown in population and geographical extent since that report was adopted, but our ambition to extend the Association to "every city and town" has grown apace, and we strive with renewed vigor to benefit that "large body of citizens"—the American pharmacists of the twentieth century. The American Pharmaceutical Association is and always will be just what its members make it. The 1,219 members recorded in the volume of Proceedings for 1901 are distributed as follows :

Alabama	7	New Hampshire.....	9
Arizona.....	1	New Jersey	44
Arkansas	13	New Mexico	2
California	26	New York	149
Colorado.....	11	North Carolina.....	14
Columbia, District of	31	North Dakota.....	2
Connecticut	34	Ohio	74
Delaware	1	Oklahoma Territory	4
Florida	8	Oregon	3
Georgia.....	20	Pennsylvania.....	111
Hawaiian Islands.....	1	Philippine Islands	2
Idaho.....	1	Rhode Island	13
Illinois	82	South Carolina.....	5
Indiana	32	South Dakota	3
Iowa	21	Tennessee	14
Kansas	13	Texas	13
Kentucky	21	Utah	1
Louisiana	16	Vermont	11
Maine	21	Virginia	20
Maryland	66	Washington.....	7
Massachusetts.....	91	West Virginia.....	1
Michigan	24	Wisconsin	15
Minnesota	24	Dominion of Canada.....	18
Mississippi.....	6	Foreign countries (except Canada)	7
Missouri	104	Residence unknown	8
Montana.....	1		
Nebraska	7		
Nevada	2		
		Total	1,219

No Members.—The following Territories are without representation : Alaska, Indian Territory, Puerto Rico, Wyoming.



The Numerical Strength.—According to one of the very first laws of nature, the old pass away and make room for the new. But the balance should always be in favor of the new. If we elect each year as many new members as, or more than, we lose by death, resignations and suspensions, the Association membership must be in a healthy condition.

A Large or Small Membership? Our present membership is small compared with the number of men and women in America who are eligible for membership. But the proportion is about the same as we find in the national associations of other callings similar to our own.

This fact does not prevent us from desiring a large increase, for more members and more income means greater ability to work out the aims and purposes of the Association. I have been interested in the membership work for years and given it much thought. I find that some members are satisfied with our present status, and work along the lines of the past will hold the present numerical strength.

A majority of our most active members are anxious to materially increase the list. The pharmaceutical press and individuals are now doing all that can be expected of them. If we want a much larger membership we must look upon the work as a business proposition and employ paid agents to show desirable persons the real value of our volume of Proceedings. It remains for the members present to decide whether we are ready to adopt such a proposition.

OUR VETERAN MEMBERS.

"Every man desires to live long; but no man would be old."—*Swift*.

No Charter Member.—It is a regrettable fact that no member remains who took part in the meeting for organization fifty years ago. How eagerly we would listen to the reminiscences of one who could link the first convention of the past with the semi-centennial of the present.

Still, we have reason to be thankful that time has dealt gently with so many of our veteran members. The number who bear the marks of many years well spent is sufficiently large to indicate that those who continue in the fold of the American Pharmaceutical Association grow old slowly and few die.

I find a list of forty-five members who joined during the ante-bellum days of this country. Their fidelity to our organization for more than forty years purchased them our good opinion, and their silver locks command our veneration. I append a list of these tried and faithful members, that their names may be prominently recorded in the pages of the history of this convention.

<i>Member.</i>	<i>Address.</i>	<i>Joined.</i>
1. Dearborn, Geo. Luther	New Market, N. H.....	1853.
2. Goodwin, William Wells.....	Newburyport, Mass.....	1853.
3. Gordon, Dr. William John Maclester.....	Cincinnati, O.....	1854.
4. Sharp, Alpheus Phineas	Baltimore, Md.	1855.
5. Kent, Robert Restieaux	New York City.....	1855.
6. Baker, Thomas Robert	Richmond, Vt.	1856.
7. Candidus, Philip Charles	Mobile, Ala.	1857.
8. Ellis, Evan Tyson.....	Philadelphia, Pa.....	1857.
9. Gale, Edwin Oscar	Chicago, Ill.	1857.
10. Gale, William Henry.....	Chicago, Ill.	1857.
11. Hance, Edward Hance	Philadelphia, Pa.....	1857.
12. Perot, Thomas Morris.....	Philadelphia, Pa.....	1857.
13. Rittenhouse, Henry Norman.....	Philadelphia, Pa.....	1857.
14. Sloan, Dr. George White	Indianapolis, Ind.....	1857.
15. Wiegand, Thomas Snowden.....	Philadelphia, Pa.....	1857.
16. Heintzelman, Joseph Augustus	Philadelphia, Pa.....	1858.
17. Jenks, William Jenks	Philadelphia, Pa.....	1858.

<i>Member.</i>	<i>Address.</i>	<i>Joined.</i>
18. Lemberger, Joseph Lyon	Lebanon, Pa.	1858.
19. Milhau, Edward Leon	New York City	1858.
20. Patton, Ichabod Bartlett.....	Boston, Mass.....	1858.
21. Sander, Dr. Enno.....	St. Louis, Mo.....	1858.
22. Thompson, William Beatty	Philadelphia, Pa.	1858.
23. Dohme, Louis	Baltimore, Md.....	1859.
24. Doliber, Thomas.....	Boston, Mass.....	1859.
25. Elliott, Henry Alexander.....	Baltimore, Md.....	1859.
26. Grossklaus, John Ferdinand	Navarre, N. Dak.....	1859.
27. Harlow, Noah Sparhawk	Bangor, Me.	1859.
28. King, James Theodore	Middletown, N. Y.....	1859.
29. Land, Robert Henry	Augusta, Ga.....	1859.
30. Moore, George.....	Somersworth, N. H.	1859.
31. Orne, Joel Stone	Cambridgeport, Mass.....	1859.
32. Rollins, John Francis.....	Dover, N. H.....	1859.
33. Steele, James Gurden	Cordelia, Cal.....	1859.
34. Whitney, Henry Martin.....	North Andover Depot, Mass.....	1859.
35. Wilson, Benjamin Osgood	Boston, Mass.....	1859.
36. Drake, John Ransom.....	Milwaukee, Wis.	1860.
37. Meyer, Christian Fried. Gottlieb	St. Louis, Mo.	1860.
38. Moith, Augustus Theodore	Fishkill-on-Hudson, N. Y.....	1860.
39. Moore, Joachim Brickley	Philadelphia, Pa.	1860.
40. Owens, Richard John	Brooklyn, N. Y.....	1860.
41. Pettit, Dr. Henry McEwen.....	Carrollton, Mo.....	1860.
42. Saunders, William	Ottawa, Can.....	1860.
43. Simms, Giles Green Craycroft.....	Washington, D. C.....	1860.
44. Shinn, James Thornton.....	Philadelphia, Pa.	1860.
45. Stacey, Benjamin Franklin	Charlestown, Mass.....	1860.

Ex-Presidents.—It is quite remarkable that twenty-one of the forty-eight ex-presidents are still living. It is pleasing to find so many (eighteen) of this number with us to-day. The three absentees are Messrs. Stearns, Finlay and Morrison. The list of those living who have occupied the executive chair is as follows:

<i>President.</i>	<i>Address.</i>	<i>Date.</i>
1. Dr. W. J. M. Gordon.....	Cincinnati, O.	1864.
2. Mr. Frederick Stearns.....	Detroit, Mich.....	1866.
3. Mr. E. H. Sargent	Chicago, Ill.	1869.
4. Dr. Enno Sander.....	St. Louis, Mo.....	1871.
5. Mr. Albert E. Ebert	Chicago, Ill.	1872.
6. Mr. John F. Hancock	Baltimore, Md.....	1873.
7. Prof. C. Lewis Diehl	Louisville, Ky.	1874.
8. Mr. Wm. Saunders.....	Ottawa, Can.....	1877.
9. Dr. Geo. W. Sloan.....	Indianapolis, Ind.	1879.
10. Mr. James T. Shinn	Philadelphia, Pa.	1880.
11. Prof. John Uri Lloyd.....	Cincinnati, O.	1887.
12. Mr. A. K. Finlay	New Orleans, La.....	1891.
13. Prof. Joseph P. Remington	Philadelphia, Pa.	1892.
14. Prof. Edgar L. Patch	Stoneham, Mass.	1893.
15. Mr. Wm. Simpson	Raleigh, N. C.	1894.
16. Prof. James M. Good.....	St. Louis, Mo.	1895.
17. Prof. Joseph E. Morrison.....	Montreal, Can.....	1896.
18. Mr. Henry M. Whitney	North Andover Depot, Mass.	1897.
19. Mr. Charles E. Dohme ...	Baltimore, Md.....	1898.
20. Dr. Albert B. Prescott	Ann Arbor, Mich. .	1899.
21. Mr. John F. Patton.....	York, Pa.	1900.

This is Essentially a Veterans' Convention.—As the youngest President in point of service, as well as the most youthful in years, I ask you to join me in paying tribute to their work and extending a hearty expression of fraternal feeling.

OUR DECEASED MEMBERS.

"Cheers for the living; tears for the dead."—*Chicago Veteran Druggists' Association.*

Father Time has reaped a rich harvest in our Association, and his sickle has cut short the lives of 558 members, including those to be reported by the Secretary of the Council at this meeting. Of this number the names of 274 are published in the volume of Proceedings for 1884. Each succeeding volume mentions those who passed away during the year recorded.

For twenty-eight successive years George Washington Kennedy has served as Secretary of the Committee on Membership, and during that time paid eloquent tribute to the memory of 421 deceased members.

One of the most startling events in the history of our Association occurred when the shadow of death suddenly cast itself over the delegations just home from the St. Louis convention of 1901. The demise of ex-President Mr. William Scott Thompson, who was with us, hale and hearty, giving good cheer to old and new members, the same as he had at many conventions before, was a severe shock to all who had the good fortune to know him.

The appearance of Mr. Thompson's likeness as a frontispiece to the forty-ninth Volume of Proceedings, is a timely tribute to his long service and useful work in our organization.

A PROCTER MEMORIAL.

"Honor to whom honor is due."

The history of the world shows that its various peoples have made records of distinguished persons and important events, and it is natural for us to dwell with feelings of pride on the glory of departed men. This Association has been blessed with several members whose industry was equaled only by their pharmaceutical skill, intellectual strength, patient labor and inventive genius. Men most frequently fail in this world for lack of application rather than lack of ability. We are, therefore, naturally anxious to honor the names and perpetuate the memories of those who have proven themselves truly great in our own field of activity.

We have a Special Committee on Procter Memorial appointed to devise ways and means for establishing a memorial to the late Professor William Procter, Jr., who was one of the most active and valued members from our very beginning, in 1852, until the time of his death in 1874. Some of the State associations have similar committees, and I look for definite action at this meeting. If we can in any way associate the name of the immortal Procter with a fund in such a manner as to give greater strength and stability to the A. Ph. A., we will act in accord with the spirit of caution and foresight which he always exercised.

The creation of a medal for international award is also a popular and, I trust, a practical suggestion. In case of the formation of a separate Procter memorial fund, I would favor the making of a double-name medal, and by calling it the "Procter-Squibb" medal we would honor also our more recent eminent co-laborer, Dr. Edward Robinson Squibb, who joined the Association in 1858 and died in 1900.

OUR FINANCES.

"Every man's credit is proportioned to the money which he has in his chest."—*Juvenal.*

Our intellectual resources, energy and good will can do but little without the support of a sound financial basis. The national character of our Association renders it of the utmost importance that we direct its affairs in a broad, liberal and impartial manner.

This week we celebrate our golden anniversary and proclaim to the world that we have reached the mature age of fifty years. But we are aging only when compared with individual human life, and with the time that other similar organizations have been in

existence. The fifty years we have lived is but a mere moment of time in the many years of usefulness which lie before the American Pharmaceutical Association.

We must establish a financial policy which will insure stability and the power to be useful as long as pharmacy bears the significance which we now attach to the word. I feel that the formation of a large fund, to be kept intact and used only as an interest-bearer, is the one ideal for which we should now exert our best energies and use our mature judgment.

Our regular income for current expenses is and should be from the payment of annual dues. The amount, \$5.00 per year, paid by each member is small when compared with the practical value of the volume of proceedings. It is, however, as large as we can expect to assess. It is the aggregate which can and should be increased by the addition of new members. The initiation fee was abolished in 1887, I trust never to be readopted.

We are living in an age of bequests, donations and legacies for educational and scientific purposes. Let this Association adopt a financial policy which will insure a belief in the organization's permanency in the minds of those who have grown rich in our calling, and the A. Ph. A. will be remembered in a substantial manner.

SUBJECTS FOR DISCUSSION AND ACTION.

"Discourse may want an animated 'No,'
To brush the surface, and to make it flow;
But still remember, if you mean to please,
To press your point with modesty and ease."—*Cowper*.

In order to bring some of the subjects in my address before the Association for definite action, I recommend consideration of the following suggestions:

1. *Abstract Papers*.—Article IV of Chapter IX of the by-laws requires every person presenting a paper which will require more than ten minutes to read, to accompany the paper with a synopsis which will not require more than ten minutes for presentation. Every person presenting a paper should also be required to furnish an abstract for publication in a program to be issued under the direction of the officers of the Section to which the paper is referred.

Authors of papers should be furnished a specified number of reprints, free of charge.

2. *Discontinue General Prizes*.—I advise that we discontinue the awarding of general prizes. If deemed best, the number of special prizes may be increased.

3. *Push Sale of N. F.*—The sale of the edition of the National Formulary, now under revision, should be furthered with vigor and enterprise.

4. *Reduce Tax on Alcohol*.—The American Pharmaceutical Association should endorse the Joy bill (H. R. 178), which provides for a reduction of the tax on alcohol to seventy cents per gallon.

5. *A Standing Committee on Model Law*.—I suggest that we establish a standing committee on "A Model Pharmacy Law," this committee to co-operate each year with the presidents and committees on legislation of the various State Associations in furthering the general adoption of the law. Annual reports should be made to the American Pharmaceutical Association, giving the progress of the work and submitting such changes in the original draft as may be deemed advisable.

6. *Improve Apprentices*.—This Association should encourage, in every possible way, an improvement of the quality of apprentices and the conditions of apprenticeship. In providing the pharmacists of the future we must select proper seed, plant it in fertile soil, and not harvest the crop until the fruit is ripe.

7. *Promote Pharmacists in Government Employ*.—I commend the generous work of the Committee on Status of Pharmacists in the Army, Navy and Marine Hospital Service of the United States, and recommend a continuance of the committee.

8. *Have Government Represented at American Pharmaceutical Association Meetings*.—Invitations should be sent each year to the Secretary of War, the Secretary of the Navy, and the Secretary of the Treasury to have their departments officially represented at our annual meetings.

9. *Discuss Government Drug Laboratory*.—Chief H. W. Wiley, of the Bureau of Chemistry, should be informed of the views of this Association as to the most desirable character and scope of the work of the drug laboratory of his division of the Department of Agriculture.

10. *Continue the Exhibits*.—We should endorse the exhibit feature of our meetings as it now exists, and urge future committees to continue the display of articles illustrating the progress of American pharmacy.

11. *Promptly Publish Proceedings.*—The Association should impress upon all parties concerned the importance of issuing the report of the semi-centennial meeting at as early a date as is consistent with the nature of the work.

12. *Keep Down Size of Proceedings.*—The Committee on Publication should be instructed to keep in view the fact that the volumes of Proceedings are mainly of historical value and useful as works of reference; that all discussions which fail to serve either purpose are without function or place in the printed volumes.

13. *An Index to Fifty Volumes.*—I recommend the publication, in a separate volume, of a general index to Volumes I to L of our annual Proceedings.

14. *Frontispiece to Proceedings.*—The volume of Proceedings for each year should contain, as a frontispiece, a picture of some deceased member. The Council should make the selection.

15. *Complete List of Deceased Members.*—The volume of Proceedings for 1902, the semi-centennial year, should contain a complete list of the deceased members.

16. *Continue the Entertainment.*—Our entertainments during the annual meetings are of educational as well as social value, and are appreciated by the Association.

17. *Recognize our Delegates.*—I advise the appointment of a committee of three to consider the subject of giving the delegates from State, provincial, Territorial and the District of Columbia Associations greater recognition at our annual meetings.

18. *Send Delegates to the N. A. R. D.*—Let us name delegates to the fourth annual convention of the N. A. R. D., at Cleveland, September 23, 24, 25, and extend the sister Association a hearty greeting.

19. *Increase the Membership by Business Methods.*—I suggest that the Committee on Membership, under the direction of the Council, employ special agents to solicit new members.

20. *A Large Permanent Fund.*—I advise a free discussion of the problem of establishing a large permanent fund.

21. *Watch the Constitution and By-Laws.*—I recommend the appointment each year of a committee of three members on Constitution and By-Laws, this committee to carefully examine the Constitution and By-Laws and report desirable corrections and additions.

CLOSING REMARKS.

"The discovery of what is true and the practice of that which is good are the two most important objects of philosophy."—*Yunius*.

It is pleasing to note that so large a number of those who lead the busy life of a pharmacist have taken the time to attend this convention. It is remarkable how many in such a confining calling can, year after year, be with us. It speaks well for the American Pharmaceutical Association and for the good judgment of the members. It illustrates the fact that those who desire to have enjoyment must find it in the purpose they pursue.

In the interim between the St. Louis convention and this meeting the vitality of the Association has been maintained by the Council, officers and committees. My administration has been a successful one if measured by willing and able assistance upon the part of the members in all sections of this great country. I fully appreciate the manner in which you have sustained me in the discharge of my duties.

It is a gratifying fact that a true spirit of fairness becoming the motives of educated men pervades our discussions and deliberations. When differences do occur they are attributable mainly to influences of different circumstances.

We unite in a determination to continue an organization which shall be a union of power and usefulness for the advancement of the best interests of pharmacy. In doing so we must renounce all individual, sectional or self interests. We must maintain an organization which can be used only for the welfare of all concerned in our calling.

In closing, permit me to express the wish that our semi-centennial meeting be characterized by even a greater exhibition of good-fellowship than ever before. This, I am sure, we can find in the City of Brotherly Love, and the cradle of American pharmacy.

The President was not only applauded a number of times as he proceeded with the reading of an abstract of the above address, but was greeted with long-continued applause when he had finished.

Mr. Sheppard moved that the President's Address be referred to a

special committee of three, to be appointed by the Chair, for consideration of the suggestions and recommendations contained therein, to report at a future session of this meeting of the Association.

The motion was put to a vote and carried, and the Chair appointed on the committee Messrs. S. A. D. Sheppard (chairman), Albert E. Ebert and J. N. Hurty.

President Whelpley then resumed the chair.

The President called for the report of the Committee on Credentials at this point, and Mr. Rapelye, chairman, made the following report :

REPORT OF COMMITTEE ON CREDENTIALS.

Mr. President and Members of the American Pharmaceutical Association :

The Committee on Credentials appointed by the Chairman of the Council beg to report that they have examined the credentials of delegates from the various organizations named below, and find them correct.

Colleges of Pharmacy—Albany, Atlanta, California, Chicago, Highland Park, Maryland, Massachusetts, National, New Jersey, New York, Ontario, Philadelphia, Pittsburg, St. Louis.—14.

Schools of Pharmacy—Cleveland School of Pharmacy, Northwestern University, Purdue University, State University of Iowa, University of Kansas, University of Michigan, University of Minnesota, University of Wisconsin, Vanderbilt University.—9.

State Pharmaceutical Associations—Alabama, Arkansas, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Province of Nova Scotia, Province of Quebec, South Carolina, South Dakota, Texas, Vermont, Virginia, Washington.—35.

Alumni Associations of Colleges of Pharmacy—Chicago, Maryland, New York, Northwestern University, Philadelphia, St. Louis.—6.

National Associations—American Medical Association, British Pharmaceutical Conference, National Association of Retail Druggists, National Wholesale Druggists' Association, U. S. Public Health and Marine Hospital Service, U. S. Navy Medical Service.—6.

Local Associations—Chicago Veteran Druggists' Association, Denver Pharmaceutical Association, German Apothecaries' Society of the City of New York, Kings County Pharmaceutical Society, Manhattan Pharmaceutical Association of New York City, New York Retail Druggists' Association, Philadelphia Association of Retail Druggists, Pipestone County Pharmaceutical Association of Minnesota, Retail Druggists' Association of St. Louis, Retail Druggists' Association of Tampa, Fla., St. Louis Drug Clerks' Society, Wilmington Retail Druggists' Association.—12.

CHAS. A. RAPELYE, *Chairman*,
W. A. PUCKNER,
E. G. EBERLE.

The President stated that, without objection, the report would be accepted as read, and it was so ordered.

The President asked if there were any delegates present from the National Wholesale Druggists' Association, the National Association of Retail Druggists, and other bodies, and said that, if so, the Association would be glad to hear from them at this time.

Mr. W. C. Anderson, of New York, indicated the presence of Mr. Simon N. Jones, of Louisville, the chairman of the Executive Committee of the N. A. R. D., and Mr. Jones being invited to address the convention, did so as follows :

Gentlemen and Fellow-Members of the American Pharmaceutical Association:

About a year ago I presented my resignation as a member of this organization, not because I wanted to resign, but because I didn't want to hold on until people got to saying, "Oh, Simon Jones is a back number; he is out of the game; he is not in the push any more; he is handicapped with his age." I didn't want that. But to-day I can say that from year to year I have looked forward with a great deal of pleasure to attending this semi-centennial meeting of the Association; and this pleasure was increased when I was informed by the president of the N. A. R. D. that I was made chairman of the committee and nominated to present the congratulations of that organization to this, on this felicitous occasion. As an old member of the American Pharmaceutical Association, and as the representative of the Association devoted to commercial interests, I feel that the work of both is converging to the same point, namely, the elevation of the profession and the endeavor to make the business a profitable and honorable calling. It is an old saying down our way that "A hot toddy on a cold day will keep you warmer than a map of Florida and a whole book of pictures of stoves." No man ever developed an idea on an empty stomach, and my idea is that if the pharmacist makes a living he can think wisely and profitably, but as long as the present conditions exist it is bad for us all—the American Pharmaceutical Association, our State Associations, and ruinous to our local Associations. I believe success in business means the success of the American Pharmaceutical Association, and we should all work together. I am satisfied that in the hearts of the members of the National Association of Retail Druggists there are the kindest feelings for the American Pharmaceutical Association, and that we will in the future, as in the past, do all we can to bring success to the organization. [Applause.]

THE PRESIDENT: I believe we have with us to-day representatives of the Marine Hospital Service of the United States, Mr. Albert M. Roehrig and Mr. Samuel W. Richardson, and we shall be glad to hear from those gentlemen.

Mr. Roehrig arose and said :

Mr. President, Members of the Association and Ladies :

I have the honor, I believe, of being named as a representative of the United States Marine Hospital Service to this Association, and I wish to express on behalf of my colleagues in general, and myself in particular, the high appreciation we entertain of your efforts in our behalf. There is another gentleman in this service here who is a better talker than I am, and you will hear from him; but I want myself to thank the American Pharmaceutical Association for the great work it has done in the past for our benefit. It has certainly resulted in great advantage to us. In thanking the Association as a whole, I trust I may be pardoned if I speak particularly of that little war-horse, George F. Payne, of Atlanta. I feel that without his untiring and energetic efforts very little could have been accomplished in this direction, and we desire to thank him also, personally, for his good work in our behalf. Gentlemen, I thank you. [Applause.]

The President invited Mr. Richardson also to speak a few words, and he did so, as follows :

Mr. President, Ladies and Members of the Association :

My colleague, Mr. Roebrig, has practically filled the bill in the statements he has made with reference to the Association's good work in behalf of the pharmacists in the Marine Hospital service. A hundred years of misunderstanding and lack of appreciation of the pharmacists in the public service make it no easy task for the American Pharmaceutical Association to lift us out of the mire we had fallen into. But to-day, with a recognition of the Navy by appropriate appointment, and a recognition of the American Pharmaceutical Association by the appointment of official delegates to its meetings, it is an easy matter for us to go ahead and get all we wish and all we should require. I firmly believe, as I stand here to-day, that the time is not far distant—in fact, not many days off—when the pharmacists of the Marine Hospital service will receive the results of the work that has been done in educating the public feeling in their behalf. You may well understand how the chief of the service has been bound by certain precedents and bound by public opinion. I believe I voice the sentiments of my colleagues in the service when I say that our present chief is the best friend we have ever had in that position. We owe to him our first recognition in the classification of 1889, and also the commutation of quarters when assigned to duty where there were no regular quarters. At another time the pharmacists were recognized by an increase of pay; and now that public sentiment has been educated to that point where pharmacy has been recognized as a science, I believe our chief will again give us the same recognition and hearty support as in the past. I think he is on the point of giving us recognition in the way of increased compensation at this time; I can't say this officially, but I believe it—I think I can see the signs of the times. And now, my friends of the Association, let us go on with this good work. We have yet to receive the recognition of our brothers in the Army, who are still laboring under the same disadvantages the Marine Hospital service has labored under. But I feel sure that, with hard work and the able assistance of our friend Mr. Payne, we will reach the goal and receive all the recognition any one could reasonably ask. I thank you for your kind attention, and I hope the proceedings of this meeting may be productive of the greatest good to the greatest number. [Applause.]

The President called for some remarks by Dr. Biddle, surgeon in the Navy, and designated to represent that branch of the public service at this meeting, but the gentleman was not present. Representatives from the Army and delegates from other bodies were invited to make themselves known and to address the session, but there were no responses.

The President said the General Secretary would now call the list of the various committees, and asked that such reports as were ready be handed in to the Secretary, to be read by title only at this session and acted on hereafter.

The Secretary then called for reports from the following :

Committee on Revision of the U. S. Pharmacopæia—R. G. Eccles, Chairman.

Committee on General Prizes—William Mittelbach, Chairman.

Committee on National Legislation—F. C. Henry, Chairman.

Committee on Exhibition—Thos. P. Cook, Chairman.

Committee on National Formulary—C. Lewis Diehl, Chairman.

Committee on Semi-Centennial Celebration—Geo. M. Beringer, Chairman.

Committee on Status of Pharmacists in Government Employ—Geo. F. Payne, Chairman.

Auxiliary Committee on Membership—J. W. T. Knox, Chairman.

Delegates to National Association of Retail Druggists—F. W. Meissner, Chairman.

Delegates to National Wholesale Druggists' Association—Chas. Holzhauser, Chairman.

Delegates to Section on Materia Medica, Pharmacy and Therapeutics, American Medical Association—C. S. N. Hallberg, Chairman.

Special Committee on Procter Memorial—Joseph P. Remington, Chairman.

THE PRESIDENT: I will explain here that the Nominating Committee, which submits to the Association the names proposed for officers for the ensuing year, is composed of two delegates from each State, Territory and Province represented. These two delegates are to be selected by the entire delegation from the State, Territory or Province.

The President then declared a recess of five minutes, to give the members an opportunity to get together and select their representatives on the Nominating Committee, and stated that no one may serve on the committee unless he is a member of the Association.

At the expiration of the brief recess, the President called the session to order again, and the Secretary called the roll of the States, Territories and Provinces for the make-up of the Nominating Committee, with the following result :

Alabama—P. C. Candidus.	Michigan—H. B. Mason and P. Kephart.
Arkansas—O. M. Battle.	Minnesota—J. A. Wanous and W. A. Frost.
California—W. M. Searby.	Missouri—J. M. Good and O. F. Claus.
Colorado—L. N. Depeyre.	New Jersey—C. F. Dare and Chas. Holzhauser.
Connecticut—J. K. Williams and C. A. Rappelye.	New York—B. F. Fairchild and A. B. Huested.
Delaware—H. K. Watson.	North Carolina—E. V. Zoeller and Wm. Simpson.
District of Columbia—G. C. Simms and S. L. Hilton.	Ohio—G. L. Hechler and Jno. Byrne.
Georgia—Geo. F. Payne and R. H. Land.	Pennsylvania—Jno. F. Patton and Wm. McIntyre.
Illinois—W. O. Steinmeyer and Gus. Lindvall.	South Dakota—D. F. Jones.
Indiana—F. H. Carter and Bruno Knoesfel.	Texas—V. C. Brookes and J. Burgheim.
Iowa—G. Scherling and Jno. L. Etzel.	Vermont—C. Blakely and Z. B. Hopkins.
Kansas—D. C. Fischer and L. E. Sayre.	Virginia—T. R. Baker.
Kentucky—J. W. Gayle and S. N. Jones.	Wisconsin—R. M. Dadd and Ed. Kremers.
Louisiana—Max Samson and C. D. Sauvinet.	Prov. of Nova Scotia—F. C. Simson.
Maryland—Jno. F. Hancock and H. P. Hynson.	Prov. of Ontario—G. E. Gibbard and A. Turner.
Massachusetts—J. W. Baird and S. A. D. Sheppard.	Prov. of Quebec—H. Willis and S. Lachance.

The President then named as delegates-at-large upon the committee the following : Messrs. George W. Sloan, Indiana ; Albert E. Ebert, Illinois ; E. G. Eberle, Texas ; J. W. T. Knox, Michigan ; William Mittelbach, Missouri.

MR. SHEPPARD: Mr. President, a number of years ago, Mr. Werner, of Brooklyn, brought before the Association a very sensible suggestion, which has been almost forgotten. Mr. Werner said that he thought it would be good policy for our Association each year to elect its retiring President a member of the incoming Council. That was

done only for two or three years, and then overlooked. Now, that it may take some definite shape, I want to offer a motion on that point. Mr. Werner's argument was this—and I offer it to-day as being as good as when first offered: That the Council wants men of ability, experience and enthusiasm. Now, when a man has been elected and served as President of the Association, it is *prima facie* evidence that he is a man of ability, and after he has been at work as President of the Association for one year he must be less than human if he is not worked up to a point of enthusiasm in his work that he never felt before and never will again perhaps, and Mr. Werner's idea was that the Association should utilize its ex-Presidents in this way, and I think he was exactly right. Therefore, I offer the following resolution:

Resolved, That it is good general policy for the Association to elect the retiring President each year as one of the incoming members of the Council.

This is not in any sense mandatory, or a definite instruction to the Committee, but simply an expression of what the Association considers to be good general policy.

Mr. Caspari seconded the motion.

Mr. Payne, who had been called to the chair during the discussion of this point, put the motion to a vote and it carried unanimously.

President Whelpley then resumed the chair.

The President announced that the Secretary of the Council had a list of applications for membership which had been approved by the Council, and he would read it.

Mr. Kennedy then read a long list of 194 names of applicants, which was applauded, and moved that the gentlemen whose names had been proposed and recommended by the Council be invited to become members of the Association, and the motion prevailed.

The President stated that the National Wholesale Druggists' Association was represented on the floor in the person of Mr. Thomas F. Main, of New York, and he was sure the Association would be glad to hear from him.

Mr. Main arose to speak and was applauded as he did so. He spoke as follows:

Mr. President and Gentlemen of the American Pharmaceutical Association:

I and my associate delegates to this fiftieth annual meeting of this great Association deem it a high honor to have been so selected. It was just twenty years ago when our body known as the National Wholesale Druggists' Association sent a delegation to the meeting of this body held at Niagara Falls, and presided over by Mr. Bedford, of New York. It is a matter of history that this Association at that time did not think they could receive our delegates, on account of our not representing a recognized pharmaceutical body; but I am happy to say that our delegation was received, and I think no meeting of either association since that time has been held without the other association being represented by a delegation. And this, I think, is as it should be; for, while the National Wholesale Druggists' Association is preëminently a business body, we work along lines similar to yours, through our committee on adulteration; and our committee on adulteration has worked side by side with yours in securing legislation beneficial to the drug trade and the public at large. And now, sir, I bring from our body our heartiest greetings and congratulations, as well as our best wishes, on this happy occasion—

our greetings that you are celebrating your fiftieth anniversary, our congratulations on your magnificent record in the past fifty years: for we recognize you as the mother of the various State and local Associations, and as the author of that wise law prohibiting the importation of impure, adulterated and deleterious drugs into this country, and as also standing for higher pharmaceutical education. We bring you our good wishes, and hope that in the second fifty years of your experience you will be found, as heretofore, always in the front rank, leading the way towards a higher development of pharmacy; and in this way if our body can co-operate with you, you may be assured of our active co-operation and interest. Gentlemen, I thank you. [Applause.]

THE PRESIDENT: I am sure the American Pharmaceutical Association reciprocates these kind expressions, and I feel justified in instructing Mr. Main to return to his Association the same hearty greetings from our organization.

The President said he hoped that Mr. Chandler, of the New York College of Pharmacy, would address the Association, but Mr. Main explained that the gentleman was compelled to leave the city, but expected to return again Wednesday morning, whereupon the President expressed the hope that the Association might yet hear from him.

The President appointed the following committee on Time and Place of Next Meeting: Wm. M. Searby, of California, Chairman; E. L. Patch, of Massachusetts, Geo. F. Payne, of Georgia, D. F. Jones, of South Dakota, E. L. Boerner, of Iowa.

The President then stated that the General Secretary had several cablegrams and telegrams of congratulation upon the attainment of the fiftieth anniversary of the Association that he might read at this time, if it was the pleasure of the Convention.

The Secretary then read the following cablegrams:

DUBLIN, *Sept. 8, 1902.*

WHELPLEY, *Hotel Walton, Philadelphia:*

Irish Pharmaceutical Society's congratulations.

CAMBRIDGE, *Sept. 8, 1902.*

WHELPLEY, *Hotel Walton, Phila.:*

Fraternal greetings from British Pharmacopœia Committee.

DONALD MACALISTER, *Chairman.*

LONDON, *Sept. 8, 1902.*

PRESIDENT WHELPLEY, *Hotel Walton, Philadelphia:*

Official Representatives of British Pharmacy felicitate American confreres assembled in jubilee session. Prosperity attend you.

R. BREMRIDGE.

LONDON, *Sept. 8, 1902.*

PRESIDENT WHELPLEY, *Hotel Walton, Phila.:*

Heartiest congratulations and best wishes.

E. M. HOLMES.

KARLSBAD, GERMANY, *Sept. 7, 1902.*

AMERICAN PHARMACEUTICAL ASSOCIATION, *Phila., Pa.:*

Greeting; all hail the golden jubilee, its Spartan progenitors and sister organizations. Regret my absence; you might have enjoyed my presence. Am well and full of ginger.

I have been industrious; possess documents that will raise the rank and pay of pharmacists in regular army, navy and national guard. My love to Enno Sander and mineral waters. Beware of the entertainment committee and handshaker Schuh. Organize more thoroughly in every city, county and State; it will secure many blessings, promote fraternal relations, a higher pharmaceutical education, greater prosperity, greater professional respect, greater protection and greater political power. Amen.

GEORGE J. SEABURY.

MANCHESTER, N. H., *Sept. 8, 1902.*

CHAS. CASPARI, JR., *General Secretary American Pharmaceutical Association, Hotel Walton:*

The New Hampshire Pharmaceutical Association congratulate your society on arriving at its fiftieth anniversary. Success to your golden jubilee.

JOHN H. MARSHALL, *Secretary.*

VINCENNES, IND., *Sept. 8, 1902.*

PRESIDENT H. M. WHELPLEY, *Hotel Walton:*

Count me present. Tell boys put my name in pot.

JOHN B. BOND, SR.

These messages were received with favor by the members, and the President stated that, without objection, they would pass to the Committee on Publication. The President also stated that the Secretary had a batch of communications that might be read at this juncture; but this matter was deferred, and, on motion of Mr. Searby, the Association adjourned until to-morrow (Tuesday) morning at 10 o'clock.

SECOND SESSION—TUESDAY MORNING, SEPTEMBER 9, 1902.

The second general session was also held in the convention hall of the Hotel Walton, and was called to order at 10:30 a. m. by President Whelpley.

After making a number of announcements as to the necessity of signing the Constitution and By-laws, depositing railroad certificates with the Local Secretary, etc., the President announced as the first order of regular business the reading of the minutes of the previous session by the Secretary. Thereupon the Secretary read the minutes, which, upon motion of Mr. Kennedy, were adopted as read.

The report of the Nominating Committee was called for, and Mr. Good, chairman, read the report as follows:

REPORT OF NOMINATING COMMITTEE.

The Nominating Committee was organized by electing J. M. Good chairman and Frank C. Simson secretary. The committee nominated—

For President—Geo. F. Payne, of Atlanta, Ga.

For First Vice-President—Wm. L. Cliffe, of Philadelphia, Pa.

For Second Vice-President—Eugene G. Eberle, Dallas, Tex.

For Third Vice-President—Henry Willis, Quebec, Can.

For Treasurer—S. A. D. Sheppard, Boston, Mass.

For General Secretary—Chas. Caspari, Jr., Baltimore, Md.

For Reporter on the Progress of Pharmacy—C. Lewis Diehl, Louisville, Ky.

Three Members of Council—H. M. Whelpley, St. Louis, Mo.; John F. Patton, York, Pa., and C. S. N. Hallberg, Chicago, Ill.

J. M. GOOD, *Chairman*.

FRANK C. SIMSON, *Secretary*.

Mr. Kremers, seconded by Mr. Hynson, moved that the report be received, and the motion was put and carried.

THE PRESIDENT: The report of the committee is now before you, gentlemen.

MR. KREMERS: I should like to inquire, Mr. President, if this action is final, or whether other nominations are permissible.

THE PRESIDENT: These are the nominations made by the committee. The nominations cannot be closed without a motion to that effect.

MR. KREMERS: Then, Mr. President, I should like to put in nomination for one office a gentleman who is very well known throughout the country. The fiftieth anniversary meeting of this Association is certainly an auspicious occasion, and we possibly have the privilege of doing something that is a little unusual. If any one problem demands the attention of this Association at the present time, it is the question of the regulation of pharmacy—the uniform practice of pharmacy, and the inter-migration of pharmacists throughout the States of the United States. As it is to-day, it is difficult for persons to move from one State to another and practice the profession of pharmacy. The condition is an anomalous one, and one not worthy the twentieth century civilization of America. If any one man in this Association has done more than another to bring about uniformity in pharmaceutical legislation—and pharmaceutical legislation has its effect on the practice of pharmacy—that man is Mr. James H. Beal, of Ohio. I should like, therefore, to place in nomination for the office of President of this Association the name of J. H. Beal, of Scio, Ohio.

MR. SEARBY: Mr. President, I have the pleasure of seconding that nomination, believing that it is due to Mr. Beal to recognize the great work he has done for pharmacy, and that if he should be elected to the office of President it would be beneficial to the general interests of the Association. I say this without in any way desiring to reflect upon Mr. Payne, or the action of the committee in nominating him.

The President declared Mr. Beal to be in nomination, and asked if there were any further nominations.

Mr. Claus, of St. Louis, moved that the nomination for officers to be elected at this meeting be closed, and it was so ordered.

MR. HYNSON: Mr. President, this matter has taken a very unusual form. The work of the Nominating Committee has always heretofore been accepted; and, while I am not unfavorable to any candidate, I think it would be unfortunate, especially at this meeting, if this matter should go from the committee into this open body, and therefore I move that this matter of nomination be again referred to a special committee of five to be appointed by the chair, to report at the next general session. I believe in that way we can get fully informed in the matter. I don't believe anybody's feelings should be hurt, and I believe the gentlemen who have been nominated will be glad to decline the nomination made by the general committee, and refer the matter to this special commit-

tee. I believe this a very desirable thing to do. We don't want to get into a contest here. The gentleman nominated yesterday by the committee has friends in the Association, and the gentleman nominated to-day by Mr. Kremers has friends, and if the whole matter is referred to a special committee of five it can be settled. Indeed, I think the way to settle this matter in the future is for the Nominating Committee to select a special committee of five to refer such matters to for their consideration and investigation, so that the committee as a whole can act intelligently. I make the motion that the whole matter be referred to a special committee of five, to be appointed by the chair.

THE PRESIDENT: Does your motion refer to the entire report of the Nominating Committee?

MR. HYNSON: Yes, sir; to the entire report.

MR. PAYNE: *Fellow-members of the American Pharmaceutical Association*, as far as I am concerned in regard to this nomination, I want it from the great majority of the Association or not at all, and would prefer by far—since it has taken the direction it has—that there should be a general vote from the whole floor, and if I don't get it I will promise you I won't feel sore, but will go to work just as hard and cheerfully as I have ever done in the past. [Applause.]

MR. HYNSON: I withdraw my motion, Mr. President.

MR. EBERT: I want to say that what Mr. Hynson has said about its being unusual or unprecedented to proceed in this way is incorrect. We have done this quite frequently in the history of the Association. This is the American Pharmaceutical Association, and there is no reason why we should not have an expression on this matter. No committee should gag us in regard to whom we want for President. The proper thing for the Association to do is to do as we did many years ago, appoint a general committee and have that general committee remain right after the session and appoint a subcommittee to go over the ground carefully and report to the general committee afterwards for them to pull the wires. That is what we want to-day, and then you will have the proper consideration of the committee.

The President appointed as tellers to take the vote Messrs. Hynson, of Maryland, May, of Missouri, Holzhauser, of New Jersey, and Gayle, of Kentucky.

MR. GOOD: I would like to ask for information, who has the right to vote?

THE PRESIDENT: All members of the Association.

MR. SHEPPARD: I understand that ruling includes all those who were invited to complete their membership yesterday—194 in all.

THE PRESIDENT: According to our Constitution and By-Laws, all members of the Association are entitled to vote. That includes, of course, those that have been elected very recently. 194 were elected yesterday.

MR. REDSECKER: Are delegates entitled to vote?

THE PRESIDENT: Delegates who are not members of the Association cannot vote. I am requested to announce, however, that any delegate to this Association who will sign the Constitution and By-Laws and pay five dollars becomes a member at once.

MR. PATTON: Does this vote apply to the office of President only?

THE PRESIDENT: You are now preparing your ballots for President only. There are two candidates, Mr. George F. Payne, of Georgia, and Mr. James H. Beal, of Ohio.

MR. HYNSON: Mr. President, I have been asked by several if they can vote before their membership is complete.

THE PRESIDENT: Not until it is complete. The Constitution will be here on the table for signature in a moment.

The tellers then proceeded to take the vote, and when they had finished the President asked if anybody had been overlooked or had failed to get his ballot in, and then declared the vote closed.

Thereupon, Mr. Hynson called out the vote ballot by ballot and Mr. Holzhauer recorded the same. When they had concluded, Mr. Hynson announced that the result showed that Mr. Beal had received 46 votes for President and Mr. Payne 82. [Great applause.] Mr. Hynson declared that, according to the ballots, Mr. Payne had been elected President of the American Pharmaceutical Association.

THE PRESIDENT: The next order of business is the election of the remaining officers. How will you proceed to their election, gentlemen?

MR. BARTLEY: As there is but one candidate for each of these offices, I move that the Secretary of the Council, Mr. Kennedy, be instructed to cast the affirmative ballot of the Association electing these gentlemen to the offices named.

This motion was put and carried unanimously, and Mr. Kennedy stated that, in accordance with the motion just passed, he had cast the ballot of the Association electing to the various offices named the gentlemen recommended by the Nominating Committee in its report, save for the office of President, upon which a separate vote had just been had. Those thus voted for and elected were as follows:

First Vice-President—William L. Cliffe, Philadelphia.

Second Vice-President—Eugene G. Eberle, Dallas, Texas.

Third Vice-President—Henry Willis, Quebec.

Treasurer—Samuel A. D. Sheppard, Boston.

General Secretary—Charles Caspari, Jr., Baltimore.

Report on Progress of Pharmacy—C. Lewis Diehl, Louisville.

Council—Henry M. Whelpley, St. Louis; John F. Patton, York, Pa.; C. S. N. Hallberg, Chicago.

The President thereupon declared Mr. George F. Payne, of Atlanta, duly elected President of the American Pharmaceutical Association for the ensuing year, and the other gentlemen whose names were submitted by the Nominating Committee to the offices set opposite their names and just read by the Secretary of the Council.

The President then stated that the next order of business was the reading of the minutes of the Council, and Mr. Kennedy, Secretary, read the minutes of the third session of that body at Philadelphia, held at the

Hotel Walton, September 8, 1902 ; also the fourth session of the Council, held in Philadelphia on September 9th.

THIRD SESSION OF THE COUNCIL—SEPTEMBER 8, 1902.

A quorum of the Council having assembled, the Chairman, A. B. Prescott, called the meeting to order at 9:30 o'clock a. m., in the Hotel Walton, Philadelphia, Pa., with the following members present: Messrs. Alpers, Baker, Caspari, Diehl, Eberle, Hopp, Kebler, Kennedy, Lowe, Meissner, Payne, Rapelye, Searby, Sheppard and Whelpley.

The Secretary of Council presented the following items of business, which had come before the Council since the last meeting and had been disposed of by correspondence:

POTTSVILLE, PA., *October 5, 1901.*

To the Members of the Council:

The office of Chairman of this executive body having become vacant by the recent death of our much beloved friend, William S. Thompson, it is moved and seconded that a successor be elected in order that the business interests of the Association may not suffer. The undersigned beg to nominate Prof. A. B. Prescott, the recently elected Vice-Chairman of the Council, for the office of Chairman, and Charles E. Dohme for the office of Vice-Chairman, becoming vacant upon the election of the new Chairman.

CHARLES CASPARI, JR.,
SAMUEL A. D. SHEPPARD.

Please send your vote on the above motion to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Dohme, Eberle, Eliel, Hopp, Kebler, Kennedy, Lowe, Meissner, Payne, Rapelye, Searby, Sheppard, Stedem, Whelpley—20.

Nays—0.

Not Voting—Prescott—1.

POTTSVILLE, PA., *October 17, 1901.*

Dear Sir: I take great pleasure in informing you that Mr. A. B. Prescott, of Ann Arbor, Michigan, and Charles E. Dohme, of Baltimore, Maryland, have been unanimously elected Chairman and Vice-Chairman of the Council, the former to fill the vacancy caused by the death of our lamented associate, William S. Thompson, and the latter to fill the vacancy caused by the election of Mr. Prescott to the Chairmanship.

Both these gentlemen have accepted and entered upon their duties. All communications and motions should be sent to the newly-elected Chairman.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

ANN ARBOR, MICH., *October 24, 1901.*

To the Members of the Council: The Council of the American Pharmaceutical Association is still in mourning upon the loss of William Scott Thompson. A member of this executive body since 1880, he served as its chairman since 1894. It will be a happiness to remember his bearing as a presiding officer in the dispatch of business, his manner as a man among friends. In the conduct of his life we have seen nothing delay him in duty, nothing hinder him in the affairs of this Association. With this example the Council will proceed.

Yours respectfully, ALBERT B. PRESCOTT.

POTTSVILLE, PA., *October 24, 1901.*

Dear Sir: It is moved by H. M. Whelpley and seconded by Charles Caspari, Jr., that Thomas P. Cook, of New York City, Joseph P. Remington, of Philadelphia, and William L. Cliffe, of Philadelphia, be named as three of the members of the Committee on Ex-

hibits for the 1902 meeting; that Thomas P. Cook be chairman of the committee, with instructions to appoint two additional members, thus making a committee of five.

Please send your vote on the above motion to the undersigned.

Yours respectfully, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Stedem, Whelpley—20.

Nays—0.

Not voting—Eliel—1.

POTTSVILLE, PA., *October 26, 1901.*

Dear Sir: On the occasion of the funeral of our late esteemed Chairman, William S. Thompson, September 28th, 1901, a large floral wreath was taken to Washington, and placed on his grave in the name of the American Pharmaceutical Association. Assuming that the members of the Council may desire to contribute to the expense, subscriptions of fifty (50) cents each may be sent to George W. Kennedy, Secretary of the Council, Pottsville, Pa.

CHAS. CASPARI, JR.,
CHAS. E. DOHME,
S. A. D. SHEPPARD.

POTTSVILLE, PA., *October 31, 1901.*

Dear Sir: It is moved by H. M. Whelpley and seconded by E. G. Eberle that the Committee on Publication be instructed to publish a picture of our late Chairman, Mr. William Scott Thompson, as a frontispiece to the volume of Proceedings for 1901.

Please send your vote on the above motion to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Alpers, Baker, Beal, Caspari, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Stedem, Whelpley—19.

Nays—0.

Not voting—Cliffe, Eliel—2.

PHILADELPHIA, PA., *October 26, 1901.*

PROF. A. B. PRESCOTT, ANN ARBOR, MICH.—*Dear Prof. Prescott:* I wish to tender you my resignation of the Chairmanship of the Section of Practical Pharmacy and Dispensing, the resignation to take effect at once.

I am sorry to have to make such a decision, but my work has been increased to such an extent that it is impossible for me to do justice to myself or the Section. With the most sincere regard for you,

I am, very truly yours,

F. W. E. STEDEM.

POTTSVILLE, PA., *November 5, 1901.*

Dear Sir: It is moved by Charles Caspari, Jr., and seconded by S. A. D. Sheppard, that a page be set aside in the Records of the Council to the memory of our highly esteemed Chairman, the late William Scott Thompson, and that a committee of three be appointed by the Chair to prepare suitable resolutions expressive of the great loss this body has suffered by his death, and of the love and admiration entertained for him by the members. Please send your vote on the above motion to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of the Council*

Result of vote.

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—19.

Nays—0.

Not voting—Eliel—1.

POTTSVILLE, PA., *December 16, 1901.*

Dear Sir: It is moved by W. L. Cliffe, and seconded by G. W. Kennedy, that the next annual meeting of our Association be held during the week of September 7th, 1902, and that the headquarters be at the Hotel Walton, Philadelphia. Please send your vote on the above motion to the undersigned.

Yours respectfully,

GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote.

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Rapelye, Whelpley—16.

Nays—0.

Not voting—Eliel, Prescott, Searby, Sheppard—4.

POTTSVILLE, PA., *December 26, 1901.*

Dear Sir: It is moved by Charles Caspari, Jr., and seconded by G. W. Kennedy, that the motion adopted fixing the date to hold the next annual meeting be reconsidered. Pending the vote to reconsider, the Council will, in order to save time, receive remarks upon the questions covered by W. L. Cliffe's motion.

Please send your vote on the above motion to the undersigned.

Yours respectfully,

GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote.

Yeas—Baker, Beal, Caspari, Diehl, Dohme, Eberle, Kennedy, Meissner, Prescott, Rapelye, Searby, Sheppard, Whelpley—13.

Nays—0.

Conditional—Lowe, Payne—2.

Not voting—Alpers, Cliffe, Eliel, Hopp, Kebler—5.

POTTSVILLE, PA., *January 8, 1902.*

Dear Sir: The motion to reconsider the vote fixing the time for holding the next annual meeting of our Association, has been carried.

Any remarks on this subject should be sent to the undersigned, Secretary of the Council, as early as practicable, and a date proposed for the holding of our next meeting in Philadelphia.

Yours respectfully,

GEO. W. KENNEDY, *Secretary of the Council.*

POTTSVILLE, PA., *February 12, 1902.*

Dear Sir: It is moved by Charles Caspari, Jr., and seconded by S. A. D. Sheppard, that the fiftieth annual meeting of the American Pharmaceutical Association be held from September 8–22, 1902, the city of Philadelphia having already been selected as the place of meeting. The date of opening is the same as that named by the local Secretary and his Committee of Arrangements, and is accepted at their special request.

According to notice of date January 8, the Council has voted to reconsider the previous vote upon date of the annual meeting, and remarks upon this matter were then requested in the Council. In sending the above given motion to the Chairman of the Council, Mr. Chas. Caspari, Jr., says: "After quite a protracted discussion, we find that the Philadelphia Committee of Arrangements cannot accept our suggestions as to a change of date of meeting, and so Mr. Sheppard and I have agreed to offer the enclosed motion, which embodies the date originally named for the opening of the meeting and prolongs the time to two weeks, so as to allow of the meeting of the Committee of Revision and Board of Trustees of the U. S. Pharmacopœia Convention."

Please send your vote upon Mr. Caspari's motion to the undersigned, Secretary of the Council. If discussion is desired, please address remarks to the Chairman of the Council without delay.

Respectfully yours,

GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote :

Yeas—Alpers, Baker, Beal, Caspari, Diehl, Dohme, Kebler, Kennedy, Lowe, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—15.

Nays—Eberle—1.

Not Voting—Cliffe, Eliel, Hopp, Meissner—4.

POTTSVILLE, PA., *February 3, 1902.*

Dear Sir: It is moved by H. M. Whelpley and seconded by George W. Kennedy, that the General Secretary of the American Pharmaceutical Association be instructed to invite foreign bodies whose interests are allied with those of the American Pharmaceutical Association to send delegates to the semi-centennial meeting of this Association, to be held in the city of Philadelphia, September, 1902.

Please send your vote on the above motion to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote :

Yeas—Alpers, Baker, Beal, Caspari, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—18.

Nays—0.

Not Voting—Cliffe, Eliel—2.

POTTSVILLE, PA., *February 22, 1902.*

To the Council of the American Pharmaceutical Association :

Your Finance Committee presents the following budget of expenditures for the fiscal year 1902-1903, which after consultation with the Secretary and Treasurer, has been found adequate to meet our expenses for the fiscal year :

Salaries	\$2,800 00
Proceedings	2,500 00
Miscellaneous Expenses	300 00
Printing and Stationery.....	250 00
General Prizes	200 00
Traveling Expenses	150 00
Stenographer	150 00
Badges and Bars	80 00
Journals for Reporter on the Progress of Pharmacy	50 00
Section on Scientific Papers	30 00
Section on Education and Legislation	30 00
Section on Commercial Interests	25 00
Section on Practical Pharmacy and Dispensing.....	25 00
Committee on Transportation.....	30 00
Committee on Membership.....	25 00
Insurance	20 00
Premium on Treasurer's Bond	12 00

\$6,667 50

CHARLES E. DOHME, *Chairman,*
CHARLES A. RAPELYE,
CLEMENT B. LOWE.

Please send your vote on the above recommendation to the undersigned.

Respectfully yours, GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote.

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Eberle, Eliel, Kennedy, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—17.

Nays—0.

Not Voting—Dohme, Hopp, Kebler—3.

ANN ARBOR, *March 11, 1902.*MR. GEORGE W. KENNEDY, *Pottsville, Penna.*

My Dear Mr. Kennedy: On November 13th the Council adopted a motion providing, among other things, that a committee of three be appointed by the Chair to prepare suitable resolutions on the death of Mr. Thompson. I do not remember with certainty whether I made that appointment or not, and I do not find a record of it. If the appointment has been made, please notify Mr. Sheppard, who composed the committee. If the committee has not been appointed, I now make the following appointment: Messrs. Caspari, Sheppard and Kennedy. In this case you will, of course, kindly notify both of the other members who are appointed.

Very sincerely yours,

A. B. PRESCOTT.

POTTSVILLE, PA., *June 21, 1902.*

Dear Sir: It is moved by S. A. Sheppard and seconded by Geo. W. Kennedy, that the Treasurer be authorized to transfer one hundred and sixty dollars (\$160.00) from the appropriation for Miscellaneous Expenses to the account of the appropriation for Proceedings.

Please send your vote to the undersigned.

Yours respectfully,

GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote:

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Shepperd, Whelpley—19.

Nays—0.*Not voting*—Eliel—1.POTTSVILLE, PA., *July 19, 1902.*

Dear Sir: The enclosed program for the fiftieth annual meeting proposed by the General Secretary, the Local Secretary and the Secretary of the Council, is submitted to the members of Council for a vote,

Please send your vote to the undersigned.

Yours respectfully,

GEO. W. KENNEDY, *Secretary of the Council.*

PROPOSED PROGRAM OF THE FIFTIETH MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION TO BE HELD AT PHILADELPHIA, SEPTEMBER 8 TO 22, 1902.

Monday, Sept. 8, 9.30 a. m.—Meeting of the Council.

3.00 p. m.—First General Session.

8.00 p. m.—Reception tendered to the delegates and ladies at the Hotel Walton.

Tuesday, Sept. 9, 10.00 a. m.—Second General Session.

3.00 p. m.—Meeting of the Section on Commercial Interests.

Wednesday, Sept. 10, 10.00 a. m.—Session devoted to discussion of exhibits.

2.30 p. m.—Drive through Fairmount Park, along the banks of the Schuylkill and Wissahickon to Chestnut Hill.

8.00 p. m.—First Session of the Section on Scientific Papers.

Thursday, Sept. 11, 10.00 a. m.—Second Session of the Section on Scientific Papers.

3.00 p. m.—Golden Jubilee Meeting of the Association.

8.00 p. m.—Jubilee Banquet.

Friday, Sept. 12, 10.00 a. m.—Session of the Section on Practical Pharmacy and Dispensing.

1.30 p. m.—Steamboat excursion and lunch on the Delaware River, tendered by the Philadelphia Association of Retail Druggists.

8.00 p. m.—Third Session of the Section on Scientific Papers.

Saturday, Sept. 13, 10.00 a. m.—First Session of the Section on Pharmaceutical Education and Legislation.

Monday, Sept. 15, 10.00 a. m.—Second Session of the Section on Pharmaceutical Education and Legislation.

3.00 p. m.—Last General Session.

Tuesday, Sept. 16, to Monday, Sept. 22, Social Sessions.

Result of vote:

Yeas—Alpers, Baker, Caspari, Cliffe, Diehl, Dohme, Hopp, Kennedy, Kebler, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—15.

Noes—Beal—1.

Conditionally—Lowe—1.

Not voting—Eberle, Eliel, Meissner—3.

POTTSVILLE, PA., *July 26, 1902.*

Dear Sir: The following communication has been received by the Chairman of the Council and by him requested that the same be submitted to the members of Council for a vote.

Please send your vote to the undersigned.

Yours truly,

GEO. W. KENNEDY, *Secretary of the Council.*

SYRACUSE, N. Y., *July 19, 1902.*

PROF. A. B. PRESCOTT, *Ann Arbor, Mich.:*

Dear Sir: I desire to publish the formulas of the National Formulary in the Proceedings of the New York State Pharmaceutical Association for 1902. Can this privilege be granted this Association, and, if so, on what terms?

I remain, yours respectfully,

EDW. S. DAWSON, JR., *Secretary.*

Yeas—Baker, Caspari, Diehl, Dohme, Eberle, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Searby, Sheppard, Whelpley—14.

Nays—Rapelye—1.

Not voting—Beal, Eliel—2.

Conditional—Alpers, Cliffe, Hopp—3.

POTTSVILLE, PA., *Aug. 7, 1902.*

Dear Sir: The Special Committee on Semi-Centennial Celebration, Mr. Geo. M. Beringer chairman, having requested a grant of two hundred dollars for various expenses in connection with their work, it is moved by Chas. Caspari, Jr., and seconded by Geo. W. Kennedy, that the sum of two hundred dollars, or as much thereof as may be necessary, be appropriated for the use of said committee.

Please send your vote to the undersigned.

Yours truly,

GEO. W. KENNEDY, *Secretary of the Council.*

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—18.

Nays—0.

Not voting—Dohme, Eliel—2.

POTTSVILLE, PA., *Aug. 11, 1902.*

Dear Sir: It is moved by Chas. Caspari, Jr., and seconded by Geo. W. Kennedy, that the General Secretary be authorized to have twenty gold badges and forty gold bars made for the Philadelphia meeting.

Please send your vote to the undersigned.

Yours truly,

GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote :

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Dohme, Eberle, Hopp, Kennedy, Kebler, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—19.

Nays—0.

Not voting—Eliel—1.

POTTSVILLE, PA., Aug. 14, 1902.

Dear Sir : The following tentative program for the Special Jubilee Session of the American Pharmaceutical Association, to be held at Philadelphia College of Pharmacy on Thursday afternoon, September 11, 1902, has been received from George M. Beringer, of the Committee on Semi-Centennial Celebration, and the same is now submitted to the members of Council for a vote.

Please send your vote to the undersigned.

Yours truly,

GEO. W. KENNEDY, *Chairman of the Council.*

CAMDEN, N. J., July 29, 1902.

Tentative Program proposed for the Special Jubilee Session of the American Pharmaceutical Association, to be held at the Philadelphia College of Pharmacy, on Thursday afternoon, September 11, 1902.

TITLE.

Address—A Retrospect of the Development of American Pharmacy and the American Pharmaceutical Association. Dr. Frederick Hoffmann, Berlin, Germany.

Address—"The Advance in Pharmaceutical Manufactures during the Past 50 Years" (to occupy about 15 minutes). Dr. William J. Schieffelin.

Paper—"Our Centennial" (to occupy about 15 or 20 minutes). Prof. John Uri Lloyd.

Address—"The Father of American Pharmacy: William Procter, Jr." (to occupy about 15 or 20 minutes.) Mr. Albert E. Elbert.

Paper—"Reminiscences" (to occupy about 15 or 20 minutes). Mr. Joseph L. Lemberger.

The speeches are to be interspersed with appropriate orchestral music. There probably will be some changes made in the titles above given, and the order of speaking may be changed later if deemed advisable. This is submitted simply as an outline, as a too rigid program is not desirable, so that any changes deemed necessary may be made during the meeting.

Respectfully submitted,

GEORGE M. BERINGER, *Chairman,*
Committee on Semi-Centennial Celebration.

Result of vote :

On Program.

Ayes—Baker, Beal, Caspari, Cliffe, Diehl, Eberle, Hopp, Kennedy, Lowe, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—15.

Nays—0.

Not voting—Alpers, Dohme, Eliel, Kebler, Meissner—5.

On Place of Holding Session.

Ayes—Baker, Beal, Cliffe, Diehl, Eberle, Hopp, Kennedy, Lowe, Prescott, Sheppard, Whelpley—11.

Nays—Caspari, Rapelye, Searby—3.

Not voting—Alpers, Dohme, Eliel, Kebler, Meissner, Payne—6.

POTTSVILLE, PA., August 23, 1902.

Dear Sir : WHEREAS, Messrs. G. Claridge Druce and N. H. Martin, President and Vice-President respectively of the British Pharmaceutical Conference, and Dr.

Frederick Hoffmann, of Berlin, Germany, will attend the semi-centennial meeting of our Association next month; and

Whereas, It seems desirable to extend to our visitors appropriate courtesies;

Therefore, It is moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that the three gentlemen named be considered guests of the American Pharmaceutical Association during their stay in Philadelphia.

Please send your vote to the undersigned.

Yours truly,

GEO. W. KENNEDY, *Secretary of the Council.*

Result of vote.

Yeas—Alpers, Baker, Beal, Caspari, Cliffe, Diehl, Eberle, Hopp, Kennedy, Lowe, Meissner, Payne, Prescott, Rapelye, Searby, Sheppard, Whelpley—17.

Nays—0.

Not voting—Dohme, Eliel, Kebler—3.

Geo. W. Kennedy, Secretary of the Committee on Membership, presented the names of 194 applicants for membership, which on motion were recommended to the Association.

The following resolutions on the death of our late beloved Chairman, William S. Thompson, were presented by Chas. Caspari, Jr., chairman of the special committee, and on motion of S. A. D. Sheppard, seconded by W. M. Searby, were adopted by a rising vote.

RESOLUTIONS

ON THE DEATH OF WILLIAM SCOTT THOMPSON.

WHEREAS, The Council of the American Pharmaceutical Association has sustained a severe loss by the death of its beloved Chairman, William Scott Thompson, who passed away on September 25, 1901, almost immediately after adjournment of the last annual meeting; and

Whereas, It is but meet that the Council should place on record its deep sense of grief caused by the severance of ties which for many years have added so much to the harmony and pleasure of its transactions; be it therefore

Resolved, That in the death of William Scott Thompson the Council has lost a most valuable member and estimable presiding officer, who by his excellent judgment and wise counsel had endeared himself to all his associates in a manner which called forth the highest admiration for his ability and true manliness.

Resolved, That the members of the Council will ever cherish with warm affection the memory of their lamented friend and chairman, who by his many sterling qualities and affability of manner, set an example which all should strive to emulate.

Now that our beloved associate has left the field of his earthly usefulness, how prophetic do the last words appear which he spoke in accepting the position of third Vice-President of our Association at St. Louis in 1901. Of him may it truly be said: The world is better for his having lived therein.

CHAS. CASPARI, JR.,
S. A. D. SHEPPARD,
GEO. W. KENNEDY,
Committee.

Chas. Caspari, Jr., read the following report of the Committee on Publication, which on motion of W. C. Alpers was received.

REPORT OF THE COMMITTEE ON PUBLICATION.

Mr. Chairman and Members of the Council of the American Pharmaceutical Association:

Your Committee on Publication beg leave to report that the Proceedings of the forty-ninth annual meeting have been published and a copy of the same delivered in January of the present year and since that time to every member entitled thereto according to the Treasurer's accounts, besides the usual number (100) of complimentary copies to our honorary members, State libraries, the pharmaceutical press, educational institutions and foreign scientific bodies. Fourteen hundred and fifty copies of the book were printed, of which 225 remain on hand in flat sheets; 1,160 copies have been bound in cloth and 65 copies in paper. It was found necessary during the past year to bind in cloth 40

copies of the 1899 volume of Proceedings and 10 copies of the 1900 volume, the stock having become exhausted. The cost of publication and delivery for the year 1901-1902 is shown by the following items:

Composition, paper and press-work (1,450 copies).....	\$1,905 10
Binding 1,160 copies in cloth (1901) @ 23 cts.	\$266 80
“ 10 “ “ (1900) @ 23 cts.	2 30
“ 40 “ “ (1899) @ 23 cts.	9 20
“ 65 “ in paper (1901) @ 8 cts.	5 20
	<hr/> 283 50
Expressage and Postage: Expressage (cloth 28, paper 26); Postage (cloth 30, paper 28)	358 14
Illustrations	92 28
Journals for the Reporter.....	44 27
Salary of the Stenographer	150 00
Salary of the Reporter on the Progress of Pharmacy.....	750 00
	<hr/> \$3,583 29

For the Committee,
Baltimore, July 2, 1902.

CHAS. CASPARI, JR., *Chairman.*

The report of the Committee on Membership was presented by Geo. W. Kennedy, Secretary, and on motion of Geo. F. Payne was received and referred to the Association.

It was moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that the treasurer be instructed to credit five dollars, as by order of Council, on the ledger account of A. Brandenberger. This was adopted.

On motion of S. A. D. Sheppard, seconded by Geo. W. Kennedy, Chas. Morgan of Baltimore was granted permission to withdraw his resignation and resume membership in the Association.

The treasurer presented an inquiry from M. I. Wilbert of Philadelphia, asking that he might be granted a rebate on the life membership fee of the amount paid by him for back numbers of the Proceedings. On motion of H. M. Whelpley the treasurer was instructed to answer this question in the negative.

Chas. Caspari, Jr. moved, seconded by S. A. D. Sheppard, that Article II of Chapter IX of the By-Laws of the Council be amended by adding after the word “present” the words “a majority of votes cast being considered sufficient to decide a question.” This was laid over for action at a subsequent session.

It was moved by Chas. Caspari, Jr., and seconded by H. M. Whelpley, that the treasurer be directed to write to Robert B. King, advising him of the exact condition of his account and the by-laws governing the same, with a view of enabling his completion of membership. This was adopted.

Geo. F. Payne moved, seconded by Chas. A. Rapelye, that the words “and having read its Constitution and By-Laws” be stricken from the application for membership blanks. This was adopted.

On motion of H. M. Whelpley, seconded by Chas. A. Rapelye, it was agreed that a committee of three be appointed to consider and report on a new form of application for membership.

The chair appointed Messrs. Whelpley, Kennedy and Hopp as the committee.

On motion of Chas. A. Rapelye, seconded by L. C. Hopp, it was agreed to invite Messrs. Ebert, Kremers and Lloyd to attend the next session of the Council and present their plan for formation of an historical section of the Association.

The following report of the Auditing Committee was presented by C. B. Lowe, Chairman, and, on motion of S. A. D. Sheppard, seconded by C. Lewis Diehl, was accepted and the recommendations adopted.

PHILADELPHIA, *September 8, 1902.*

To the American Pharmaceutical Association:

Your committee appointed to audit the accounts and vouchers of the Treasurer, General Secretary and Chairman of the Council, would report that we have performed the duty assigned us.

We find that the accounts of the Treasurer and General Secretary have been carefully and accurately kept, and that the balance of \$1540.41, reported by the Treasurer, is shown by the bank book to be on deposit with the New England Trust Company, of Boston. We find that the Book of Investment of Permanent Funds, in charge of the Chairman of the Council, agrees with the Treasurer's account and corresponds to the balance of \$2090.49, now on deposit with the Fidelity Trust Company, of Philadelphia. We would recommend that a better book be procured by the Council for keeping the record of the invested funds, the one now in use being only an apology for an account book. We think that the Association may have a pardonable pride in the knowledge that this volunteer organization has invested funds to the amount of \$15,000.00, and cash balances in the special and general funds amounting to \$3630.89, making a grand total of \$18,630.89.

Respectfully submitted,

CLEMENT B. LOWE,
CHARLES W. HANCOCK,
WILLIAM MCINTYRE,
Committee.

The special committee to consider and report on the advisability of electing corresponding members in foreign countries, presented an unfavorable recommendation through Chas. Caspari, Jr., which was unanimously adopted.

Chas. Caspari, Jr., announced that, on account of ill-health, Dr. Fred'k. Hoffmann would be unable to preside at the jubilee session, and had been compelled to return to Europe by advice of his physician. Also that the address prepared by Dr. Hoffmann had been printed and would be read at the jubilee session.

It was moved by C. B. Lowe, seconded by Chas. A. Rapelye, that H. M. Whelpley be elected honorary Chairman to preside at the jubilee session. This was unanimously adopted.

Chas. Caspari, Jr., presented on behalf of Messrs. Burroughs, Wellcome & Co., of London, England, a case of lithographic prints, 13,500 in number, to be used for illustration, in the coming volume of Proceedings, of a paper to be read before the Scientific Section.

On motion of H. M. Whelpley, seconded by W. M. Searby, a vote of thanks was tendered the donors for their valuable and handsome contribution.

H. M. Whelpley thanked the Council for the honor conferred in electing him to preside at the coming jubilee session, and expressed deep regret at Dr. Hoffmann's indisposition, which prevented him from serving as Honorary Chairman.

Chas. Caspari, Jr., submitted a suggestion to publish in the fiftieth or golden jubilee volume of Proceedings half-tone portraits of all past and present officers of the Association and of the Sections. On motion of H. M. Whelpley, seconded by Geo. W. Kennedy, it was agreed to recommend to the Association the adoption of the suggestion made by the General Secretary.

On motion of H. M. Whelpley, the treasurer was requested to open a list for the purpose of receiving contributions to defray unusual expenses in connection with the publication of the Proceedings of the jubilee semi-centennial meeting.

The Chair appointed as a Committee on Credentials, Messrs. Rapelye, Puckner and Eberle, with instructions to report direct to the Association.

On motion, Council adjourned to meet on Tuesday morning at 9 o'clock.

GEO. W. KENNEDY, *Secretary.*

FOURTH SESSION OF THE COUNCIL—SEPTEMBER 9, 1902.

The Council convened at the Hotel Walton, Philadelphia, Pa., at 9 o'clock a. m., with the following members present: Messrs. Alpers, Baker, Caspari, Diehl, Eberle, Hopp, Kennedy, Payne, Rapelye, Sheppard, Whelpley, and A. B. Prescott in the chair.

On motion of Chas. A. Rapelye, the reading of the minutes of the previous session was dispensed with.

The Secretary of the Committee on Membership presented the names of thirty-six applicants, which, on motion of E. G. Eberle, were accepted and ordered to be referred to the Association with favorable recommendation.

The amendment to the By-Laws of the Council, proposed at the third session by Chas. Caspari, Jr., was taken up and adopted.

Messrs. Kremers, Ebert and Lloyd having been invited to meet the Council at this session, in connection with the proposed plan for establishment of an historical section, the gentlemen named addressed the Council in behalf of the subject. On motion of H. M. Whelpley, seconded by S. A. D. Sheppard, it was agreed to recommend to the Association that a standing Committee on Historical Pharmacy be established, with directions to hold one public session annually; the committee to consist of a chairman and secretary, to be appointed by the President of the Association, and such members of the Association as the chairman of the committee may select.

On motion, Council adjourned to meet again at 9 o'clock a. m. on Wednesday.

GEO. W. KENNEDY, *Secretary*.

THE PRESIDENT: You have heard the reading of the Minutes of the Council. What will you do with them?

MR. MAYO: I move that the Minutes of the Council be approved as read. And in making that motion I would like to add a suggestion as regards the resolutions adopted by the Council concerning Mr. Thompson. I should rather regret—and I am sure that all of us would rather regret—for it to appear in the records that it was the Council alone, and not the entire body of the Association, which had a thorough appreciation of the unusually high character of the services performed by Mr. Thompson for this Association. His mind was of so broad a grasp and so well balanced, he was a man so admirable in every aspect, that his presence was an inspiration to all the younger men of the Association. Therefore, Mr. President, I move that in adopting the Minutes of the Council it be expressly stated that the resolution as passed by the Council regarding the death of our late dear friend and officer, Mr. Thompson, be looked upon not only as conveying the sentiments of respect and admiration of the members of the Council, but of the whole body of the Association.

MR. SHEPPARD: I rise to second that motion; and at the same time, Mr. President, before we take action on this matter, I would like to bring before the Association a matter which came directly at the close of the minutes of the Council, and which I believe is too important not to be emphasized before we take action in the matter now in hand. Our Secretary had some trouble in reading it on account of the interlineations. I would like to read it and then explain it in a measure:

"Moved by the Council to recommend to the Association that a standing committee on historical pharmacy be established, to hold one public meeting annually, the committee to consist of a chairman and secretary to be named by the President of the Association, and such members of the Association as the chairman of the committee may select."

Now, that may seem a simple motion at first glance, but it is very far-reaching in its effect. Three of our best members—men of large experience and bright thought—have been considering this subject for a long time. They are Mr. Edward Kremers, of Madison, Wis.; Mr. Albert E. Ebert, of Chicago, and Mr. John Uri Lloyd, of Cincinnati.

They believe that the time has come when the history of pharmacy should receive from this Association direct attention. They all recognize the difficulties in bringing this matter of historical interest—these dry details, which sometimes will lie in a book for years, and only be looked at by somebody who is searching after such matters—before a large body like this. Consequently, this plan was formulated, first by them and then by the Council—you might say, whipped into shape—that this Association shall, from this time on, become the depository of matters of historical interest pertaining to pharmacy in a regular, systematic manner. Historic matters in the United States are receiving more and more attention each decade, and it is time for this body to take direct action in regard to the particular work in which our members are engaged. If we do not take this action, the history of much that affects pharmacy will be lost forever. We all know that there are facts occurring from day to day which, unless some record in permanent shape is made of them, will be lost to future generations. This matter seemed so important that the Council felt that it was desirable to bring it before you in this direct manner.

The motion as presented by Mr. Sheppard was put to a vote and carried.

MR. HYNSON: Mr. President, the matter of Mr. Thompson's memorial does not seem to have been brought before this Association with sufficient clearness, or pointedly enough. I, therefore, make the motion, sir, that the Association as a body adopt the resolutions of the Council as to Mr. Thompson—that the resolutions be read again and adopted by the Association as a whole, and by a rising vote.

Mr. Rapelye seconded the motion, and Mr. Kennedy again read the resolutions.

MR. PATTON: I cannot speak of Mr. Thompson without emotion. I am still conscious of the distressing shock I experienced in the news of his sudden taking off. Parting from him but two days previous, after a most enjoyable week spent in St. Louis, I could not bring myself to realize the truth of the telegram announcing his death. The ties that bound us together were more than those of ordinary friendship. We had so many things in common. Nearly of the same age; similarity of experience in early life; alike in our tastes and aspirations; all conspired to promote a degree of congeniality most delightful and refreshing. In his life and character, Mr. Thompson possessed the qualities that commanded respect and admiration, and enlisted the sentiment of deep and lasting affection. His well balanced mind; his hopeful and happy disposition; his commanding presence and gracious manners, charmed all with whom he came in contact. He was a tower of strength in council; generous in his ready willingness to serve.

This Association will miss him beyond the power of words to express. The happy week we spent together in St. Louis will always remain with me a most fragrant memory. In looking back over the last two years of Mr. Thompson's life, I am now conscious of his declining vitality, but the eye of hope then refused to take cognizance. On one of his visits to New York, a year previous to his death, he consulted a specialist, demanding a frank and honest statement of his case.

It was given, and the verdict was: that his malady was incurable and liable to terminate fatally at any moment.

Brave and courageous heart. Without distressing his family or friends by making known his condition, he set his house in order, and went about his daily duties with a calm and serene mind, giving no outer evidence that he daily confronted the inexorable Reaper. The end came, as it must come to us all.

And may it be said of us, as we can truthfully say of our dear, departed friend, in life we loved him, and in his death we will not forget him.

The President then put the question on Mr. Hynson's motion, and it was carried by a unanimous rising vote.

The President said Mr. Kennedy, Secretary of the Council, would now be given the opportunity to read an additional list of applications for membership, and that gentleman read a list of 36, making a total of 230 to date at this meeting. The Chair stated that, in accordance with the Constitution and By-Laws, these applications would have to lie over until the next session before being acted on.

MR. SHEPPARD: Mr. President and Gentlemen, you will remember that a few moments ago Mr. Hynson called the Chairman to order, saying that he had addressed a member on the floor by his title, and it was against the rules. Mr. Hynson was right, and the Chairman yielded the point. Now, some years ago, by rather a humorous vote, this Association directed that its presiding officer should not recognize members by their titles. That is, to a large extent, a dead letter, and I have a motion I want to present covering that point. It seems to me we have carried on that farce long enough. I can talk of this, gentlemen, because I have no title. I shall not get men like Messrs. Whelpley, Caspari, Kremers, Payne, Hallberg and Prescott—men who have titles—to speak on the resolution I am about to offer. They do not care anything about it, though it is their right. But that is not the point I want to make in bringing this resolution before you. It is not the gentlemen's right at all, it is the good of the Association that influences me in presenting this resolution. I want to bring before you right here, in order to make my point, a little personal recollection. Thirty-seven years ago I first attended a meeting of this Association, a youngster twenty-three years old. I was crammed full of enthusiasm for pharmacy. I had read about *Doctor* Edward Squibb, and *Professor* William Procter, and *Professor* Edward Parrish, and *Professor* John M. Maisch—"Dutch John," as they called him. I knew them all by name and title, but had never seen any of them. The Association came to Boston, and I went to the meetings and listened to the discussions; but above anything else in that meeting—and I think I can voice the sentiment of a great many of you at your first meeting—was the knowledge that I was looking on Dr. Edward R. Squibb, of Brooklyn; Professor William Procter, of Philadelphia; Prof. John M. Maisch, of Philadelphia; Prof. Edward Parrish, of Philadelphia. That is what made the impression on me. It was the personality of those men that had more influence on me than their words. This is one of the simple facts of human nature. We come up to these meetings, and it is the personality of the men we meet that affects us more than their words. Now, in these old days it was the custom to give men their titles when addressing them or speaking of them; it was regularly done, it was universally done, it was always done. The presiding officer recognized every man by his title and by his residence. It was Prof. William Procter, Jr., of Philadelphia; Dr. Edward R. Squibb, of New York, and so on. What was the result? As a boy there I knew exactly the man that was talking. I didn't have boldness enough to ask anybody about him—I didn't need to. Now, I say that that custom, which we jokingly and humorously voted out of use some years ago, is too good to be lost. I therefore move that we rescind the resolution whereby the presiding officer was directed not to recognize anybody by his title.

MR. PAYNE: Before that motion is acted on, I want to say a few words, Mr. President. I feel that I am entitled to do so, as I have the titles of "Doctor," "Professor," etc. I am heartily in favor of calling all pharmacists "Doctor," and I do. I think they are entitled to it in ordinary intercourse with them; but the parliamentary usage of the House and Senate of the United States and bodies of that sort generally, requires all

members to be addressed as "Mister." We call one man "Professor" and another "Doctor" in addressing them ordinarily—in our part of the country we call them all "Colonel." [Laughter.] But we cannot do that here, and so I move that the motion of Mr. Sheppard shall not prevail.

Mr. Good, seconded by Mr. Kremers, moved to adopt the resolution, and Mr. Lyons moved that the resolution be laid on the table, which motion was seconded by Mr. Hynson.

The Chair called for an aye and nay vote, but was unable to decide whether Mr. Lyons' motion had carried, and then called for a rising vote on the motion to lay on the table, and the motion carried by an almost unanimous vote, and amid applause.

MR. HYNSON: I hope our worthy Treasurer will not think there is any joke about that vote.

MR. SHEPPARD: That is exactly the point I was going to make. The first vote was a humorous one, but this one seems to be serious, and the presiding officer will not, of course, recognize any one by his title. This vote may embarrass some of you gentlemen yet, though.

The Chair stated that the Chairman of the Committee on Time and Place of Next Meeting was now ready to receive invitations for the meeting of 1903, and requested that those interested should communicate with Mr. Searby at once.

Mr. Baker, of Richmond, made the point that members in rising to speak should give their names and place of residence, so that the convention could know who was talking, and spoke of the trouble he had had in presiding over a convention in Washington once, because most of those in attendance were strangers to him, and he had difficulty in getting them to announce who they were, so that he could recognize them by name. The President said the point was well taken, and he hoped the members would govern themselves accordingly.

The report of the Treasurer was now called for, and that officer read his report as follows:

REPORT OF THE TREASURER OF THE AMERICAN PHARMACEUTICAL
ASSOCIATION, JULY 1, 1901, TO JULY 1, 1902.

RECEIPTS.

Cash on hand July 1, 1901.....	\$1,379 52
Received from sale of 14 certificates @ \$7.50	105 00
" " 4 certificates @ \$5.00	20 00
" " Proceedings	183 20
" " Badges and Bars.....	94 00
" " National Formulary	378 32
" Mr. Enno Sander for Prize	50 00
" Committee on Exhibition.....	564 75
" Interest on Deposit in New England Trust Co., Boston	47 38
" " Money invested in Bonds (General Fund).....	80 00

Received from Interest on Life Membership Fund	440 00
" Annual Dues, 1896.....	\$5 00
" " 1897.....	5 00
" " 1898.....	20 00
" " 1899.....	145 00
" " 1900.....	225 00
" " 1901.....	2,470 00
" " 1902.....	2,205 00
" " 1903.....	10 00
	<hr/> 5,085 00
Received from Life Membership Fees, viz.:	
Arcadius Voiss.....	\$75 00
Thomas F. Main	20 00
Eugene A. Carrell	30 00
Henry M. Whelpley	50 00
Albert B. Prescott	20 00
Lewis P. Ohliger	20 00
Henry Kraemer	60 00
	<hr/> 275 00
Total	<hr/> \$8,702 17

DISBURSEMENTS.

1901.	
August	7. Check 879. John S. Bridges & Co., Printing and Stationery. \$43 75
	7. Check 880. Wickersham Printing Co.—
	Proceedings \$14 21
	National Formulary 1 43
	Miscellaneous 7 33
	_____ 22 97
	7. Check 881. Charles A. Rapelye, Miscellaneous 10 75
	7. Check 882. Joseph P. Remington, Special Appropriation for Committee on Exhibition..... 25 10
	7. Check 883. J. B. Lippincott Co., Special Appropriation for Committee on Exhibition..... 27 60
	14. Check 884. Wickersham Printing Co.—
	National Formulary..... \$36 60
	Proceedings 4 60
	Miscellaneous 3 00
	_____ 44 20
September	5. Check 885. John S. Bridges & Co.—
	Printing and Stationery \$13 00
	Miscellaneous 29 83
	_____ 42 83
	5. Check 886. William H. Bradford, Printing and Stationery.. 45 00
	5. Check 887. Henry Briele, Badges and Bars 72 00
	19. Check 888. Henry M. Whelpley, Committee on Membership. 55 70
	19. Check 889. Charles Caspari, Jr.—
	Miscellaneous \$32 87
	Proceedings 1 90
	National Formulary..... 1 87
	_____ 36 64
	19. Check 890. E. M. Houghton, Section on Scientific Papers.. 4 16

September	19.	Check 891. Dr. C. B. Lowe. Section on Education and Legislation	\$6 25
	19.	Check 892. H. F. Hassebrock. Committee on Membership	35 00
	19.	Check 893. C. Lewis Diehl, National Formulary.....	21 72
October	25.	Check 894. J. G. McLean, Stenographer	150 00
	25.	Check 895. Chronicle Publishing Company, Printing and Stationery.....	6 00
	25.	Check 896. Wickersham Printing Company— Proceedings	\$4 60
		Printing and Stationery	21 30
		Miscellaneous	2 95
		—————	28 85
	25.	Check 897. Nixon-Jones Printing Company, Printing and Stationery.....	3 75
	25.	Check 898. Henry Briele, Badges and Bars	60 25
	30.	Check 899. Charles A. Walter, Hermann Hager Prize.....	50 00
	30.	Check 900. Louis Emanuel, Third General Prize.....	20 00
	30.	Check 901. Henry P. Hynson, Chairman Committee on Practical Pharmacy and Dispensing, 1899-1900, Special Honorarium	50 00
	30.	Check 902. Alviso B. Stevens, Second General Prize	30 00
	30.	Check 903. Charles Caspari, Jr., Traveling Expenses	77 50
November	9.	Check 904. S. A. D. Sheppard, Traveling expenses.	98 40
	9.	Check 905. John H. Bridges & Co.— Printing and Stationery	5 05
		Committee on Membership.....	7 35
		Section on Practical Pharmacy and Dispensing ..	3 30
		Section on Scientific Papers.....	3 77
		Section on Commercial Interests	4 27
		Section on Education and Legislation.....	4 58
		—————	28 32
	10.	Check 906. Albert B. Prescott, Life Membership Fee, \$75.00 for Arcadius Voiss. See entry in Life Membership Fund following this account.	
	15.	Check 907. H. M. Whelpley, Committee on Membership...	9 85
	20.	Check 908. Julius A. Koch, Section on Education and Legislation	5 40
	20.	Check 909. Alpha Photo-Engraving Co., Proceedings.....	50 13
December	3.	Check 910. Albert B. Prescott, Miscellaneous	3 00
	10.	Check 911. Wickersham Printing Co., Printing and Stationery.....	4 25
	10.	Check 912. Nixon-Jones Printing Co., Printing and Stationery.....	3 75
	10.	Check 913. S. A. D. Sheppard, First Half-year's Salary as Treasurer, 1901-1902.....	375 00
	10.	Check 914. George W. Kennedy— First Half-Year's Salary as Secretary of Council 1901-1902	75 00
		First Half-Year's Salary as Secretary of Committee on Membership, 1901-1902.....	75 00
		—————	150 00

December	10.	Check 915. Charles Caspari, Jr., First Half-Year's Salary as General Secretary, 1901-1902	\$500 00
	10.	Check 916. C. Lewis Diehl, first half year's salary as Reporter on Progress of Pharmacy, 1901-1902.....	375 00
1902.			
January	10.	Check 917. Julius O. Schlotterbeck, Proceedings (illustrations)	40 00
	28.	Check 918. H. M. Whelpley, Miscellaneous Expenses, Committee on National Legislation, Postage, etc.....	20 00
	28.	Check 919. Meyer Brothers Drug Company, Miscellaneous Expenses, Committee on National Legislation.....	4 00
	28.	Check 920. Nixon-Jones Printing Company, Printing and Stationery	3 75
	28.	Check 921. Charles Caspari, Jr.— Miscellaneous.....	12 77
		Proceedings	15 89
		National Formulary.....	90
		Insurance	10 00
		Journals	25 49
			65 05
February	25.	Check 922. Wickersham Printing Company, National Formulary	24 50
	25.	Check 923. Nixon-Jones Printing Company, Printing and Stationery.....	3 75
March	31.	Check 924. Wickersham Printing Company— Proceedings	2185 44
		Printing and Stationery	29 75
		National Formulary.....	15 83
		Insurance	5 50
		Section on Practical Pharmacy and Dispensing...	19 16
		Section on Commercial Interests.....	3 00
		Section on Scientific Papers.....	4 50
		Section on Education and Legislation	4 50
			2267 68
	31.	Check 925. Nixon-Jones Printing Company, Printing and Stationery.....	7 50
April	10.	Check 926. John S. Bridges & Company— Printing and Stationery	\$14 05
		Committee on Membership	2 25
			16 30
	21.	Check 927. Wickersham Printing Company, National Formulary	21 00
	21.	Check 928. C. H. Buck & Company, Printing and Stationery.	27 50
	21.	Check 929. U. Holzer, Printing and Stationery.....	1 75
May	26.	Check 930. Nixon-Jones Printing Company, Printing and Stationery	7 75
	26.	Check 931. Charles Caspari, Jr.— Proceedings	\$5 98
		National Formulary	1 85
		Journals	18 78
		Premium on Treasurer's Bond.....	12 50
		Miscellaneous	3 63
			42 74

REPORT OF THE TREASURER.

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June	2.	Check 932. Wickersham Printing Company, Proceedings ..	\$304 68	
	9.	Check 933. John S. Bridges & Company, Printing and Stationery.....	17 50	
	9.	Check 934. S. A. D. Sheppard, second half-year's salary as Treasurer, 1901-1902.....	375 00	
	9.	Check 935. C. Lewis Diehl, second half-year's salary as Reporter on Progress of Pharmacy, 1901-1902	375 00	
	9.	Check 936. George W. Kennedy— Second half-year's salary as Secretary of Council, 1901-1902	\$75 00	
		Second half-year's salary as Secretary of Committee on Membership, 1901-1902.....	75 00	
			<hr/>	150 00
	9.	Check 937. Charles Caspari, Jr.— Second half-year's salary as General Secretary, 1901-1902.	500 00	
	15.	Check 938. Wickersham Printing Company— Proceedings	\$30 23	
		National Formulary.....	3 77	
		Miscellaneous.....	4 19	
			<hr/>	38 19
				<hr/>
				\$6886 76
1901.				
October	3.	Life Membership Fund, Arcadius Voiss.....	\$75 00	
November	14.	Life Membership Fund, Thomas F. Main	20 00	
December	3.	Life Membership Fund, Eugene A. Carrell	30 00	
1902.				
January	20.	Life Membership Fund, Henry M. Whelpley	50 00	
April	14.	Life Membership Fund, Albert B. Prescott.....	20 00	
May	27.	Life Membership Fund, Lewis P. Ohliger.....	20 00	
		Life Membership Fund, Henry Kraemer.....	60 00	
			<hr/>	275 00
				<hr/>
				\$7161 76

SUMMARY OF DISBURSEMENTS, JULY 1, 1901, TO JULY 1, 1902.

Proceedings	\$2657 66
Stenographer	150 00
Journals for the Reporter on Progress of Pharmacy	44 27
Salaries for 1901-1902	2800 00
Premium on Treasurer's Bond.....	12 50
Traveling Expenses.....	175 90
Section on Scientific Papers.....	12 43
Section on Education and Legislation	20 73
Section on Commercial Interests.....	7 27
Section on Practical Pharmacy and Dispensing.....	22 46
Committee on Membership	110 15
Committee on Exhibition.....	52 70
Printing and Stationery	259 15
Insurance	15 50
Badges and Bars	132 25
General Prizes	100 00
Hermann Hager Prize	50 00
Miscellaneous Expenses.....	134 32
	<hr/>
Amount paid for current expenses	\$6757 29

Life Membership Fund	\$275 00
National Formulary.....	129 47
	<hr/>
Total amount of disbursements.....	\$7161 76
Cash on hand, July 1, 1902	1540 41
	<hr/>
Total	\$8702 17

APPROPRIATIONS AND EXPENDITURES UNDER SAME, FOR THE FISCAL YEAR JULY 1, 1901,
TO JULY 1, 1902.

	Appropriations.	Expenditures.
Salaries	\$2,800 00	\$2,800 00
Proceedings	2,660 00	2,657 66
Miscellaneous Expenses.	140 00	134 32
Printing and Stationery	260 00	259 15
General Prizes	200 00	150 00
Traveling Expenses.....	200 00	175 90
Stenographer	150 00	150 00
Badges and Bars	140 00	132 25
Journals for Reporter on Progress of Pharmacy.....	50 00	44 27
Section on Scientific Papers.....	20 00	12 43
Section on Education and Legislation	30 00	20 73
Section on Commercial Interests.....	25 00	7 27
Section on Practical Pharmacy and Dispensing	25 00	22 46
Committee on Transportation	30 00	
Committee on Membership	125 00	110 15
Committee on Exhibition.....	52 70	52 70
Insurance	20 00	15 50
Premium on Treasurer's Bond.....	12 50	12 50
Unexpended Balance		182 91
	<hr/>	<hr/>
	\$6,940 20	\$6,940 20

PROSPECTIVE ASSETS.

Not counting what is due from members whose names will probably be dropped from the roll at the annual meeting, and also from members whose residence is unknown there was outstanding on the books of the Association July 1, 1902:

Annual Dues for 1901.....	\$455 00
Annual Dues for 1902.....	2,795 00
	<hr/>
	\$3,250 00

Respectfully submitted,

S. A. D. SHEPPARD, *Treasurer.*

THE PRESIDENT: You have heard the report of the Treasurer, gentlemen. It is before you for action.

Mr. Patton moved the adoption of the report as read, and the motion was seconded by Mr. Whitney and carried.

MR. PAYNE: Mr. Chairman, I desire to make the following motion: That this Association send to the Surgeons-General of the Army, Navy and Marine Hospital and Public Health Service telegrams inviting them to be present with us at this meeting, and that those branches of the service that have not already sent delegations here be requested to do so at once. Of course, these telegrams should be forwarded immediately. I think

these gentlemen will receive them with a great deal of pleasure. From many things that have happened, I am satisfied that they had a more considerate feeling towards us of late than for many years past, and I believe they will appreciate this courtesy. I believe it will be a good thing for us to do this.

Mr. Hynson seconded Mr. Payne's motion, and it carried unanimously. The Secretary was called on to make his report, which he did, as follows :

REPORT OF THE FINANCIAL ACCOUNTS IN THE CARE OF THE GENERAL SECRETARY.

A. RECEIPTS AND EXPENDITURES ON ACCOUNT OF NATIONAL FORMULARY, FROM JULY 1, 1901, TO JUNE 30, 1902.

I. Receipts.

From Sales and Payment of Bills due July 1, 1901 \$378 32

II. Expenditures.

Binding 450 copies National Formulary in cloth, @ 11 cts.....	\$49 50	
" 45 " " " int., @ 18 cts.....	8 10	
" 500 " Physicians' Epitome, N. F., @ 4¼ cts.	21 25	
Imprinting cover of Physicians' Epitome.....	3 25	
Expressage and Postage (National Formulary)	23 65	
" " " (Physicians' Epitome).....	2 00	
Typewriting, Postage, Stationery, etc. (bill of C. L. Diehl, Chairman of Com. on N. F.)	21 72	
	<hr/>	129 47

III. Remittances.

To Treasurer, as per Treasurer's Receipts..... 378 32

IV. Sales.

To dealers and individuals, as per ledger accounts 344 86

V. Accounts Unpaid.

By dealers 61 44

VI. Bills Due by the Association.

All bills due have been paid.

VII. Stock on Hand.

Copies in flat sheets (unbound)	54	
Copies bound in cloth	26	
" " " interleaved	22	
" " sheep	9	
" " " interleaved	7	
	<hr/>	118

B. SUMMARY OF TOTAL RECEIPTS AND EXPENSES ON ACCOUNT OF NATIONAL FORMULARY SINCE 1888.

Receipts to June 30, 1901 (see Proc., Vol. 49, p. 34)	\$12,154 14	
Receipts from July 1, 1901, to June 30, 1902.....	378 32	
	<hr/>	\$12,532 46
Expenses to June 30, 1901 (see Proc., Vol. 49, p. 34)	\$7,345 91	
Expenses from July 1, 1901, to June 30, 1902	129 47	
	<hr/>	7,475 38

Total Receipts from Sale of Physicians' Epitome from June 1, 1900, to June 30, 1902	\$368 39
Total Expenses on Account of Physicians' Epitome from June 1, 1900, to June 30, 1902	560 80

C. SALE OF PROCEEDINGS.

Receipts from July 1, 1901, to June 30, 1902	\$183 20
Remitted to Treasurer, as per Treasurer's Receipts	183 20

D. ACCOUNT OF BADGES AND BARS.

On hand July 1, 1901 (see Proc., Vol. 49, p. 34)	Badges 13, Bars 67
Received Sept. 20, 1901, from Henry Briele, Mfr.	" 20 " 50
" " " "	" 25 " 20
	<hr/> 58 137
Badges sold from July 1, 1901, to June 30, 1902, 32 @ \$2.00	\$64 00
Bars sold from July 1, 1901, to June 30, 1902, 40 @ 75 cts.	30 00
	<hr/> \$94 00
Remitted to Treasurer, as per Treasurer's Receipts	94 00
Balance on hand July 1, 1902	Badges 26. Bars 97.
Receipts from Sale of Badges and Bars to June 30, 1901 (see Proc., Vol. 49, p. 34)	\$824 35
Receipts from July 1, 1901, to June 30, 1902	94 00
	<hr/> 918 35
Total Cost of Badges and Bars to June 30, 1901 (see Proc., Vol. 49, p. 34)	\$775 35
Cost of 45 Badges received September, 1901	83 25
Cost of 70 Bars " " "	49 00
	<hr/> 907 60

CHAS. CASPARI, JR., *General Secretary.**Baltimore, July 2, 1902.*

THE PRESIDENT: Gentlemen, you have heard the report of the General Secretary. It is before you for action.

- Mr. Whitney, seconded by Mr. Searby, moved that the report be adopted as read, and the motion was put and carried.

The President announced that the next order of business was reports from the standing committees; and Mr. Caspari, chairman, read the report of the Committee on Transportation, as follows:

REPORT OF THE COMMITTEE ON TRANSPORTATION.

Mr. President and Members of the American Pharmaceutical Association:

Your Committee on Transportation beg leave to report that application was made on June 20, 1902, to the Trunk Line Association for reduced rates on account of the Fiftieth Annual Meeting, and a rate of one and a third fare for the round trip, on the certificate plan, was promptly granted, together with an extension of the selling dates for going tickets from September 4th to 15th inclusive, return tickets being made available to September 25th inclusive. This arrangement was subsequently concurred in by the Southeastern, the New England, the Central and the Western Passenger Associations.* A

* With the exception that the Southeastern Passenger Association fixed the selling dates for going tickets in its own territory at September 4th to 10th inclusive.

new arrangement in regard to the validation of certificates was put into effect by the traffic associations on August 1st, by which every holder of a certificate is required to pay the sum of twenty-five cents to the special agent of the railroads as a fee for validating the same. This individual payment is in place of the lump sum heretofore demanded of the Associations asking for reduced rates. It has been agreed that the Special Agent of the Trunk Line Association shall be in attendance at the meeting on two days, September 11th and 15th, from 9 a. m. to 6 p. m., for the purpose of validating all certificates presented.

Messrs. Paul L. Hess, of Kansas City, and Chas. R. Sherman, of Omaha, have kindly consented to look after transportation for members from the far west. A plentiful supply of the circular of information regarding the arrangements for the semi-centennial meeting has been distributed.

For the Committee,
Baltimore, September 1, 1902.

CHAS. CASPARI, JR., *Chairman.*

The chair stated that, without objection, the report of the Committee on Transportation would stand adopted, and it was so ordered.

The report of the Committee on U. S. Pharmacopœia was next in order, but Mr. Eccles, chairman, was not present, though Mr. Mayo said he had told him he expected to be in attendance later in the week, and the report was passed for the time being.

Chairman Mittelbach read the report of the Committee on General Prizes as follows :

REPORT OF THE COMMITTEE ON GENERAL PRIZES.

Your Committee, appointed by the President after the St. Louis meeting, begs to submit the following report :

The problem of deciding the relative merits of papers, all of which belong to the same division of science, may not be an easy one, even if the judges are expert in the line of work represented. The problem, however, becomes exceedingly difficult and the result well-nigh useless, if the papers represent totally distinct branches of science, in all of which the judges can not be expert.

Your committee would recommend, therefore, if the awarding of prizes is to be continued, that the Council be requested to revise the rules and by-laws pertaining to the awarding of prizes in accordance with the following principles, and to submit the results of their deliberations to the Association assembled in general session.

1. Papers are to be classified according to that branch of the science or art of pharmacy which they represent.

2. For each division but one prize shall be offered.

Concerning the papers submitted at the St. Louis meeting, your committee begs to report that it has been unable to arrive at any satisfactory conclusion. We would recommend that last year's papers be likewise referred to the judges to be appointed in accordance with the new rules to be formulated by the Council. In this way only can a satisfactory distribution of prizes be effected.

WM. MITTELBACH,
EDWARD KREMERS.

THE PRESIDENT: You have heard the report of the Committee on General Prizes. The President in his address recommended the discontinuing of general prizes. That report has been referred to a special committee, and I would suggest that this report containing certain recommendations be referred to the same committee.

Mr. Mayo moved that the report be so referred, and the motion was seconded by Mr. Bartley and carried.

MR. HYNSON: I would like to move that the matter of the Enno Sander Prize be also referred to the same committee, with the request to consult the donor. It is a fact that the prize was given to be distributed or awarded by the Committee on Practical Pharmacy and Dispensing, but it is not so ordered by any resolution, and I think that matter ought in some way to be definitely fixed. So I move that the matter of the Enno Sander Prize be considered by this same committee.

THE PRESIDENT: I scarcely think that would be within the scope of the Committee's authority—the Committee on President's Address. These are only the general prizes.

MR. HYNSON: I would change the motion, then, to refer the matter to the Council.

THE PRESIDENT: Then let it come up at another time.

MR. HYNSON: Very well, then.

Mr. F. C. Henry, Chairman, requested that the Secretary read the report of the Committee on National Legislation, now in order, and the Secretary presented it as follows:

REPORT OF THE COMMITTEE ON NATIONAL LEGISLATION.

To the Officers and Members of the American Pharmaceutical Association:

Gentlemen: Your Special Committee on National Legislation respectfully submits the following report:

There was very little legislation accomplished at the past session of Congress that affected pharmacy. That which engrossed the attention of the Committee for the past year was the attempted passage in the District of Columbia of a bill to "regulate the sale of poisons" in the said District, also House Bill No. 7189, changing the name of the Marine Hospital Service to that of Public Health Service.

In December there appeared in all the Washington newspapers, and afterwards copied by many of the drug journals, a synopsis of a bill drafted by the Health Office of the District of Columbia which had been submitted to the District Commissioners for approval, entitled a "Bill to regulate the sale of Poisons in the District of Columbia." The bill is too long to enumerate, so we recite the following clause, which was the most objectionable one, and one which would have affected many manufacturing pharmacists other than those in the District, and would have been a bad precedent, especially for the States that are contemplating new pharmacy laws.

The following is the objectionable clause:

"No druggist shall retail any preparation in quantity containing a toxic adult dose of any such poison without first, in the case of poisons, plainly and legibly labeling the bottle, box or paper containing the same with the popular name of such poison, and in the case of poisons and of substances and compounds aforesaid labeling the bottle, box or paper containing the same with the word 'poison,' an intelligible statement of the treatment of poisoning thereby, the name of the owner of the pharmacy, and the address of the place where sold. Nor unless the person to whom the same is to be delivered be personally known to the pharmacist, or person making the delivery, to be more than sixteen years of age, and upon due inquiry found to be aware of the poisonous character of the poison, compound or substance which he is about to receive, and represent that it is to be used for a legitimate purpose."

This bill was most vigorously protested against and the following letter was sent by your Committee to the District Commissioners. The fate of the proposed bill was, that it was never reported to Congress and now lies dormant in the Commissioners' Office.

CHICAGO, Jan. 16th, 1901.

To the Board of Commissioners of the District of Columbia.

Gentlemen: In one of the trade journals I note that a bill to regulate the sale of poisons in the District is being prepared for submission to Congress by your Honorable Body. If the publication referred to correctly represents the bill, some of its provisions would seriously affect the drug business in the District and would become at least a subject of interest throughout the United States. One of the propositions which the bill is reported to embody, is a requirement that every bottle, box, or paper containing a substance or compound which in the aggregate contains a "toxic adult dose of poison," shall be specifically labeled *Poison*, and shall be accompanied by printed instructions for appropriate treatment in the case of poisoning by the use of said compound.

In this connection I respectfully ask leave to submit the following suggestions:

1. A very large per cent. (probably 50 per cent.) of the business of the druggists consists in the sale of "household" remedies. Many of these remedies have been sold and widely used for twenty-five or fifty years, and some of them for longer periods. The universal custom is to place upon the bottle or package specific directions for use, and the public have become habituated to consulting and following such directions. As a rule the strength of these preparations is much less than the strength of the average physician's prescription, and in my experience and observation, the danger of poisoning from this class of remedies is infinitely less than from physicians' prescriptions. In an experience of nearly fifty years in the pharmacy business, I can recall few cases where persons have been poisoned by swallowing excessive quantities of such remedies; while perhaps cases of poisoning from the careless use of medicines sold upon prescription are frequent.

2. As to the cases of suicide by the use of drugs, I have never known a would-be-suicide to purchase a domestic remedy as a means of ending his life. Almost invariably such persons procure a known poison. Judging from what I have observed in Chicago during a lifetime, the danger from death by poisoning from the use of such remedies is inconsiderable.

3. Many of the oldest and most widely used proprietary and domestic remedies contain small quantities of opium or of some other drug ordinarily scheduled in pharmacy laws as a "poison." But, in the form in which such remedies are sold, they are no more dangerous than many other remedies which do not contain these specific drugs.

4. It would be a serious injustice to the drug trade to be compelled to label as "poisons" household remedies which have been used and sold for generations, and which are not, and never have been regarded as poisonous in any popular acceptance of the term. There is also the further and serious objection that it would tend to make the poison label so common and so familiar to the sight that it would soon cease to serve the purpose for which it was designed, and might lead to the careless use of real poison properly so labeled.

This Committee is necessarily much interested in legislation by Congress upon this subject, and I respectfully urge that in any recommendations by your honorable Board, the conservative lines established by the experience of many years in the matter of pharmacy legislation may receive due consideration.

Respectfully yours,

F. C. HENRY,
ALBERT E. EBERT,
W. C. ALPERS.

In December last a bill No. 7189 was introduced in the House of Representatives changing the name of the Marine Hospital Service to "Public Health Service," and generally granting military rank to the Medical Officers and increasing the pay of the Surgeon-General to something over \$7,000 per annum. The Hospital Stewards of the Marine Hospital Service appealed to the American Pharmaceutical Association to help them to secure the adoption of an amendment to this bill, giving the pharmacist commissioned rank one grade lower than the Assistant Surgeon and pay of \$1,200 per annum. The work of the American Pharmaceutical Association stopped the immediate consideration of the bill, and as a result of the delay another bill was introduced by the Medical Officers which varied considerably from the original bill and cut down the Surgeon-General's pay. A separate bill was introduced by the Georgia members to give the pharmacists commissions and the \$1,200 pay.

Senator Spooner also introduced a bill to take the Quarantine and Health matters away from the Marine Hospital Service, and to form a separate Health Service.

The introduction of all these bills resulted finally in the report of a compromise bill by Senator Spooner from the Senate Committee, which changed the name to the "Public Health and Marine Hospital Service," fixed the pay of the Surgeon-General at \$5,000,

cut out the military rank for the Medical Officers, but otherwise about the same as the original bill. The title of the Pharmacist was changed from Hospital Steward to that of Pharmacist, but otherwise no concessions to the Pharmacists.

We have learned that Surgeon-General Wyman in an interview, promised to increase the pay to a satisfactory figure, but up to date nothing has been done.

On July 1st, a bill was introduced by Hon. H. C. Smith giving the Pharmacist the pay of \$1,200 but eliminating the commissions, and this bill is still before the House for the next session, and we hope to aid the Pharmacists to secure its passage.

It has been suggested to your Committee that we bring before the Association and try and devise means to secure the prevention of the many immoral advertisements that are now appearing in many of our daily newspapers, especially advertising "abortion, misconception," and many other similar remedies. No doubt we have all seen such, but have never given them sufficient thought. It is a well-known fact that many women become invalids, and many die, from the use of these remedies. We have State as well as Federal laws that should prevent it if they were only enforced, and we think it our duty now to try and see that it is done, and if found defective, then try to secure such laws that will accomplish the result.

Your Committee suggests that a department of "Public Health" be established in our form of government departments. If it is necessary to have a Department of Agriculture or Commerce, is it not equally necessary that a "Department of Health" be established to look after this very important matter, concerning every citizen of the country. If such a department existed, many of the present evils relating to both branches of the profession could be easily regulated, and the recognition of pharmacy in the service of the United States would be different.

Nothing has been done with House Bill No. 178, providing for the reduction of the tax on alcohol to seventy cents per proof gallon, and your Committee asks for further instructions on this subject when the bill is brought up at the coming session of Congress.

In conclusion, your Committee would like instructions as to what further steps they should take to modify the present existing law of Patents, Trade Marks and Copyrights, also as to any other national legislation or removal of present laws affecting the drug business like that of the annual license as a retail liquor dealer.

Respectfully yours,

FRANK C. HENRY,

Chairman Special Committee on Legislation.

THE PRESIDENT: Gentlemen, what will you do with this very exhaustive report of the Committee on National Legislation? I will point out that the committee asks for instruction in regard to action on the bill to reduce the tax on alcohol, and will also remind you that the President in his address recommended an effort to have the tax on alcohol reduced; it would be proper to refer this portion of the report to the Committee on President's Address.

Upon motion of Mr. Hallberg, it was so ordered.

MR. HALLBERG: In reference to the proposed legislation in the District of Columbia, the Chairman of the committee read a letter protesting against legislation restricting the sale of patent medicines, in which the statement appears that there are, or have been, no more fatalities resulting from these patent medicines than from physicians' prescriptions: that is the way I understood it, and I believe that is correct. Now, I would not like to see that go out to the world, because it would be assumed that it was the sense of this Association, and I certainly would protest against that being the sense of this Association, and as being a serious reflection on the medical profession. I do not think the pharmacists are receiving so many prescriptions from the physicians at the present time

that they ought to go out of their way and try to suppress the further writing of prescriptions by physicians by any such statement as this. I think that ought to be modified. Of course, it is difficult to bring up the question just now and act on it, as Mr. Ebert is not in the room; but I could not sit still—I had to protest against any such statement. Perhaps the Chairman can call Mr. Ebert's attention to that, and he may possibly modify it. If he will agree to do that, I will be satisfied.

MR. HELFMAN: Possibly I may be under a wrong impression about this report, but it seems to me there was an important omission here. Just at the adjournment of Congress—the very last day—President Roosevelt signed a bill, thus making it a Federal law—the full text of which was published in the *Oil, Paint and Drug Reporter* and one or two other papers, I believe—which provides that no retail druggist shall sell vaccine virus, or antitoxin, or anything of the kind, after the date stamped on it by the maker. It prohibits the sale at any date later than that which the manufacturer puts on the package, and provides a severe penalty for so doing. I simply thought some attention ought to be called to that important measure.

THE PRESIDENT: While these remarks are not directly in order, they will become a part of our records, and I think will accomplish the objects intended by the speakers.

The next report is that of the Committee on National Formulary. It has been customary for some years past to refer this report to the Section on Practical Pharmacy, and a motion to that effect would be in order.

Upon motion of Mr. Beringer, it was so ordered.

Mr. Beringer, Chairman, then read the report of the Committee on Semi-Centennial Celebration as follows:

REPORT OF THE COMMITTEE ON SEMI-CENTENNIAL CELEBRATION.

PHILADELPHIA, PA., 9, 8, 1902.

To the Officers and Members of the American Pharmaceutical Association:

Your Committee on Semi-Centennial Celebration respectfully submit the following report:

The Proceedings of the Association for the years 1897, 1898, 1899, and 1901 contain reports from our predecessors, and at the last annual meeting the Association decided by resolution to hold a Special Jubilee Session in Philadelphia in 1902, and that Dr. Frederick Hoffmann, of Berlin, Germany, be invited to preside at this meeting, and to deliver the address of the occasion. With only this meagre outline, and without positive instructions as to the character of the celebration, your Committee were confronted with the duty of arranging for commemorative features of the meeting that would appropriately celebrate our Semi-Centennial.

After carefully considering these various reports and suggestions, the Committee deemed it advisable to extend the idea of a Jubilee Session, and to have in addition to the address of our honored associate, Dr. Frederick Hoffmann, several additional addresses by prominent American pharmacists. The programme for this special session was prepared and has been adopted by the Council. In addition, we recommended to commemorate this jubilee by having a banquet. This suggestion was eagerly adopted by the local committee of arrangements, and they have energetically worked out the details and provided means necessary for the entertainment. No doubt the commemorative feature of the occasion will be maintained.

Our Committee also decided to further commemorate the occasion by an historical exhibition that would illustrate the advance made in Pharmacy and the history of our As-

sociation. The Committee on Exhibits kindly co-operated and furnished the space needed. An appeal was made to members, colleges and friends to lend the Committee appropriate material for exhibit. That there was associated in the minds of the contributors the remembrance of those who have been active in developing the Association and making its progressive history, was evidenced by the many souvenirs and relics of our once active members that we have received. Sentiment has predominated and decided the character of the exhibit, and we believe that our members will appreciate this tribute to the memory of the pioneers of American Pharmacy.

As a record of the exhibition and a souvenir of the Golden Jubilee Anniversary, a descriptive catalogue has been prepared, and an edition of 2000 has been printed. The size adopted was such that it can be mailed with or bound in the Proceedings if desired. The committee repeats the recommendation that the forthcoming Proceedings should contain a full account of the special commemorative features of the fiftieth annual meeting, and be printed in a distinctive style and binding.

GEORGE M. BERINGER, *Chairman*,
RICHARD M. SHOEMAKER,
M. N. KLINE,
JOS. L. LEMBERGER,
HY. P. HYNSON.

THE PRESIDENT: The report of the Committee on Semi-Centennial is before you, and contains a recommendation. Perhaps the recommendation had better be read again before we adopt the report.

MR. BERINGER: The special recommendation was, that the Proceedings of this year be printed in distinctive style of binding. It is a repetition of the recommendation made by previous committees of other years.

THE SECRETARY: I would say, Mr. President, that under the recommendation of a previous Committee on Semi-Centennial—the committee discharged at St. Louis—the Council was directed to see to it that the Proceedings of this particular meeting should be given special distinction, by way of being larger, on better paper, etc., and I presume the recommendation of the committee this year is simply meant to be in accord with the former recommendation, and designed to give special force to that recommendation.

MR. BERINGER: Yes, sir; that is all.

The report, with this understanding of the effect of the recommendation, was then, on motion of Mr. Searby, adopted.

MR. BERINGER: I might say here that in preparing the exhibition we have on display for you over at Horticultural Hall across the way, we have endeavored to obtain material from all over the country, and we have some material that I think will be of interest to all the members present. While it has been omitted from the catalogue of entertainment published, I think the members can profitably spend some time in looking over the exhibits, and I hope they will not fail to do so.

MR. HYNSON: As a non-active member of that committee I think I can, without impropriety, refer to the excellent work done by it, and especially to the work done by the Chairman. I do not think we can afford to overlook the work done by Mr. Beringer, and I think every one here should show his appreciation by a visit to the exhibition. It seems to me it is one of the most distinctive features of the whole meeting. It is something that appeals to us, and brings us in touch with the past. Now, I want to move in this connection that we give a special vote of thanks to Mr. Beringer for his excellent work.

This vote was seconded by Mr. Payne.

MR. PAYNE: I just want to say I visited this exhibit last night, and I enjoyed my stay there as much or more than I ever did at any exhibition of a similar size. There are many things there that must have given Mr. Beringer a great deal of trouble to get together.

THE PRESIDENT: The President is pleased to state that the committee—and especially the chairman—has performed very willing and very gratifying work in this direction.

The vote of thanks to Mr. Beringer was then unanimously accorded.

Mr. Kennedy, Secretary of the Committee on Membership, then made the following report:

REPORT OF THE COMMITTEE ON MEMBERSHIP.

To the Chairman and Members of the Council of the American Pharmaceutical Association:

Gentlemen: In compliance with the requirements of the By-Laws of our Association, it gives me great pleasure to submit to you my 28th annual report of the Committee on Membership. Year after year goes by, yet I assure you that I appreciate the honor of being able to serve you in the capacity of secretary of the committee at the present time, as well as feeling proud of the fact of having served you for so many years in the past. This being the 50th anniversary of our Association, it is certainly a most joyful one to all the members, and particularly so to those of long-standing membership, who have watched its progress from time to time. While we all feel jubilant over the success our Association has wrought to the profession in elevating it to a higher standard as well as by its beneficial effect upon members individually, yet, in addition to these reasons, your Secretary, upon whom for twenty-eight years the work has devolved generally of looking after the hundreds of new members that have joined our ranks and entered upon the common cause of the Association, rejoices over its steady increase in membership, and expresses the hope that the same may continue until all the worthy members of the profession throughout the country are found within its ranks.

Immediately after the adjournment of the 49th annual meeting, held in St. Louis, Mo., last year, your Secretary gave the duties of his office prompt attention by mailing the customary papers for the completion of membership to each applicant who was accepted and invited by the Association. At the last meeting one hundred and fifty-three applicants were proposed as proper persons to become members, and of this number one hundred and forty-seven, or ninety-six per cent, completed their membership and their names were placed on the roll of members. It will be noticed that but six failed to complete their membership, which makes the percentage higher than it has been for many years. This speaks well of the members proposed and of those who extended the invitations to the new members. A cursory glance at the names of our new colleagues shows them to be learned and scientific pharmacists and progressive and enterprising business men. The new members are credited to twenty-five states, Canada, Cuba and the Philippine Islands.

During the past year, over five thousand invitations have been sent out and, up to the present time, quite a large number of applications have already been received by your Secretary. The prospect for a large increase in membership this year is very favorable. Great credit is due the President of the Association, the Committee on Membership, and many active members throughout the country for the many applications already received and reported to be still in their hands.

The Treasurer, S. A. D. Sheppard, reported to your Secretary that there were on

August 20th, 1902, eighty-eight members liable to be dropped from the roll for the non-payment of dues. While the number this year is smaller than that of the past several years, yet it is still far too large. In fact, there is no reason why any one should neglect the payment of dues in view of the many advantages that accrue to one through membership in our Association. Apart from the value derived from the information on pharmaceutical topics contained in the Proceedings from year to year, the social features more than amply repay one for the small investment. It has been demonstrated on numerous occasions that a membership is likewise advantageous to the pharmacist who spends part of his leisure time in travel, by the cordiality with which he is received and the hospitality with which he meets at the hands of his fellow members throughout the country. A mere member of the profession may travel from coast to coast, meeting similar persons in every town, hamlet or city in his way, yet only as man to man; but, making known the fact that he is a member of an association the constituents of which are known to be men of integrity and honor, as is our Association, it speaks words that no letter of introduction can convey, and insures for the party the confidence and hospitality of his brother member. If every member of our Association would but stop for a moment and think of these matters and the many other benefits that naturally result to him by reason of his membership, he could not but realize that it is his duty to look after the Association's welfare in this respect. There should be no delinquents, and it is to be hoped that all will give this matter their immediate attention before their names are stricken from the roll.

Since our last meeting seventy-nine members have been dropped for non-payment of dues. It is to be regretted that this should be the case after their attention had so often been called to the fact that the Association needs something material to subsist upon, and particularly at a time when men in all the various trades and professions are daily uniting themselves together for their mutual advantage, both scientifically and socially. While in many cases it may be attributed to retirement, change of profession, or the entering of other pursuits of life, yet the fact remains that, in our Association, as in every other organization, there will get among the number, those who lack pride in their chosen profession and look only to the commercial side and the pecuniary rewards resulting therefrom, and of course their loss is not felt and the foundations upon which the Association is built remains firm and stable. It should be the desire of every member to see all the worthy members of the profession throughout the country united in one great body and, consequently, should aid and facilitate the Committees in this work by inviting and proposing for membership the names of those honest and respected pharmacists in their immediate vicinity. By doing this, and continuing to do so from year to year, it would be but a short space of time before the fond hopes of the organizers of our Association would be fully realized and the Association be one of the grandest institutions in the country.

Report on Membership.

Active and contributing members in good standing at last report	1,113
Members elected since last report	147
Total	1,260

Loss in Membership (active).

By resignation	44
By transfer to life membership	7
By death	19
Dropped from roll for various reasons	79
Total	149
Number on roll at this report	1,111

Life Membership.

Number on roll at last report	109
Number added since last report	7
Total.....	116

Loss in Life Membership.

By death	6
Number on roll at this report	110

Honorary Membership.

Number on roll at last report	11
Additions.....	0
Total.....	11
Loss by death	1
Number on roll at this report	10

Total Membership.

Active or contributing members	1,111
Life members	110
Honorary members.....	10
Total.....	1,231

The solemn duty yet remains to pay a word of tribute to our deceased brothers. Like a child walking through a beautiful garden and heedlessly picking here and there a beautiful and much admired flower, so Death has walked through our midst picking from our number member after member, regardless of person, their usefulness to humanity, or the sorrow their loss naturally brings to our Association. Yet, we cannot but submit to the will of Him who doeth all things well and answer the summons of His grave and undaunted messenger. With aching hearts and a spirit of sadness we pay words of tribute to their memory, permitting our expressions of sorrow to waft to the dear ones at the homes they have left as a consolation to them in the sad hours of their bereavement. We cannot but mourn their loss deeply, as they were all men of honor and conspicuous in their devotion to the profession. Their lives were exemplary and their devotion to the common cause of our organization should be the means of encouraging and inspiring others along these lines.

Among the number of our deceased associates are found the names of William S. Thompson, Eugene Du Puy and Henry T. Cummings, men who took not only a deep and active interest in the advancement of our Association, but also in elevating the profession of pharmacy in general. I speak now of one whose strength lay in his gentleness of manner and confidence of conviction. His honesty of purpose and achievement; his thorough integrity and honor; his word as good as his bond; his purity of life; his humility, in honor preferring others to himself; his helpfulness to all who needed help; his ability and readiness to give advice; his gentleness, kindness and courtesy to all—these are the attributes that mark the eventful life of William S. Thompson. Again, we go back for the last time to that little gathering of pharmacists in the city of Philadelphia fifty years ago, engaged in formulating plans for the organization of a national association of pharmacists, and see among the number actively engaged the person of Eugene DuPuy, who afterwards labored with us for nearly half a century to make our Association what it is to-day, and whose fond desire was to be present at our Golden Jubilee. While he is not here in person, his memory is still fresh in our hearts, and, together with those who were his associates in the founding of our Association, will be forever cherished. Again, in 1853, in the city of Boston, Mass., at the meeting of that small nucleus of

pharmacists, we see the person of Henry T. Cummings joining their ranks, and for years after working strenuously to promote the Association's welfare, which efforts were crowned with marked success. Up to the time of the death of his colleague, Mr. DuPuy, he held the proud distinction of being the second oldest member of our Association, after which, though but for a few months, the greater honor of being the oldest member on its roll at that time.

While it would be a great pleasure to take up the life of each deceased brother and dwell on the manly attributes possessed by him, yet sufficeth it to say, in addition to the many good qualities set forth in their memorials contained in this report, that they were all men of honest principles, liberal and broad-minded policies, natural gentleness, moral strength, unflinching courage, and possessed of those accomplishments which caused them to be honored and admired by all their acquaintances and lovers of the pharmaceutical profession.

The following is a list of deceased members brought to the attention of your Secretary :

Chabot, David Pierre, Jewett City, Conn.	Kaltwasser, August P., St. Louis, Mo.
Cummings, Henry T., Tacoma, Wash.	Kemp, Edward, New York, N. Y.
Conrath, Adam, Milwaukee, Wis.	Laing, Albert A., Cambridge, Mass.
Coombs, Charles C., Boston, Mass.	Martindale, William, London, England.
DuPuy, Eugene, Detroit, Mich.	Mennen, Gerhard, Newark, N. J.
Gill, George, Mt. Vernon, N. Y.	Moffit, Thomas S., San Francisco, Cal.
Gosman, Adam J., Baltimore, Md.	Osmun, Charles A., New York, N. Y.
Hammel, Joseph, Medford, Wis.	Peabody, Wm. H., Buffalo, N. Y.
Haviland, Henry, Brooklyn, N. Y.	Sauer, Louis W., Cincinnati, Ohio.
Heinemann, Otto, Cincinnati, Ohio.	Schumacher, Albert C., Ann Arbor, Mich.
Heschong, John J., Peoria, Ill.	Thompson, William S., Washington, D. C.
Howey, John J., Montreal, P. Q., Canada.	Vonachen, Frank H., Peoria, Ill.

David Pierre Chabot, of Jewett City, Conn., died at the home of John Gardner, of that city, on March 6, 1902, after a long illness, in the thirty-fourth year of his age.

Mr. Chabot was born in 1868, at St. Charles, county of Bellechasse, Province of Quebec. He studied Pharmacy in Quebec, under Dr. Ed. Morin. In 1887, he came to Waterbury, Conn., where for two years he studied under Mr. Williams in his pharmacy. There he became an active worker among the local societies, and also for the French-American convention of the State of Connecticut. In 1888, he was secretary of the convention at New Haven, and afterwards a member of the committee in organizing. He represented the French Canadians of Jewett City at Waterbury at that convention, when he first became established as a druggist there. He went from Waterbury to North Grosvenordale, where he stayed six months. In 1897, he was vice-president of the convention, and in 1898 became its president, when it was held in this place.

Mr. Chabot was a public-spirited citizen to a remarkable degree, holding a number of local offices, among which were those of burgess, notary public and registrar of votes. He took a great interest in all things pertaining to the public welfare, and his services were much appreciated. He could always be found lined up for good government, and that which was right and just.

He became a licensed druggist in 1888, having passed the examination before the Connecticut Board of Pharmacy, in Hartford. He had established a finely-equipped drug store in Jewett City, which he carried on for twelve years, disposing of the drug business November 27, 1901, on account of his ill health. His death, when but in the prime of life, cast a gloom over the entire community.

He leaves his mother, Mrs. Mary Chabot, of Montreal, a sister and two brothers, Louis and Joseph, in Quebec, and a brother, Frank, in Waterbury, to mourn his loss.

Deceased became a member of our Association in 1895, at the meeting held in Denver, Colorado.

Henry T. Cummings of Tacoma, Washington, one of the oldest members of our Association, died at his home in that city on December 15th, 1901. Mr. Cummings was born at Yarmouth, Me., on November 12th, 1822. At the age of fourteen he entered Bowdoin College and graduated in 1841. He subsequently entered the Harvard Medical School, from which institution he graduated several years after with honors. He practiced medicine for two years, but finding that his deafness, an infirmity with which he had become afflicted in early life, interfered with his practice, he gave up the same and went into the drug business about 1845. He continued the business until 1880, when he was obliged to give up the same for the same reason that compelled him to give up the practice of medicine. On June 26, 1854, he was appointed by Governor Crosby "Assayer of Ore Metals and Other Substances." He was subsequently re-appointed by Governor Morrill on July 18th, 1859, for a period of four years. He was one of the first Commissioners of Pharmacy for the State of Maine when that body organized, and was successively reappointed until his removal to Tacoma, Washington, in 1892. A severe illness in 1891 left him practically an invalid, but the change of climate benefited him very much. While he never engaged in business again in Tacoma, yet for years he would take long constitutionals and explore the surrounding country. He spent much time in reading and study and was scarcely ever to be found at home without a book in his hand. While he lived a much isolated life owing to his unfortunate infirmity, yet he was much honored, respected and admired by all his acquaintances. He was deeply interested in the profession of pharmacy and took an important part in all moves for the elevation of the profession. He was an active member of the Maine Pharmaceutical Association, of which he was one of the organizers. Deceased became a member of our Association in 1853, at the meeting held in Boston, Mass., and up to the time of the death of Eugene Du Puy in October, 1901, was second oldest member on its present rolls, after which he held the proud distinction of being the oldest member, though but for a few months.

Adam Conrath, of Milwaukee, Wis., one of the most accomplished pharmacists of Wisconsin, died at his home in that city on December 19th, 1901, after an illness of one hour. During the morning he attended to business affairs as usual, and was about to go to his store when he was taken suddenly ill, complaining of a severe pain in the left side, dying shortly afterwards. Mr. Conrath was a native of Germany. He came to Milwaukee with his parents when but four years of age. At an early age he was apprenticed to Mr. Frederick Spindler, a typical German apothecary. After serving his apprenticeship, he was employed by I. N. Norton, and later by the firm of John H. Tesch & Co., in Milwaukee. In the beginning of the seventies he went to Philadelphia and entered the Philadelphia College of Pharmacy, from which institution he graduated with high honors on March 11th, 1873. After completing his studies he clerked in Chicago for a short time, and then returned to Milwaukee to accept a position as prescription clerk in the pharmacy of Mr. C. Widule. The latter recognizing the rare abilities and talents of Mr. Conrath, after the expiration of two years' service a partnership was offered him, and the same was accepted on November 1st, 1875. Mr. Conrath was an enthusiast in his profession, being thoroughly impregnated with the spirit and teachings of such men as John M. Maisch, Robert Bridges, William Procter, Ed. Parish and others, and nothing afforded him more pleasure than an opportunity to impart to others from his rich store-house of knowledge the elements of the various branches of the profession.

He always took a live and active interest in every effort to promote the welfare of pharmacy, and was one of the organizers of the Wisconsin Association, and contributed many valuable and interesting papers and results of his personal investigations at the annual gatherings of both organizations. His talents and industry were recognized by

his associates in this state, by recommending him to the Governor of this state, as member of the Wisconsin State Board of Pharmacy, in which capacity he served for ten years, from 1882 to 1892. As a member of the Board, he was instrumental in perfecting a model system of examinations; the system then laid out by Mr. Conrath, and the efficient secretary, Mr. E. B. Heimstreet, is considered a model of the kind and was copied by many other states.

Mr. Conrath was also an enthusiastic botanist; his botanizing excursions during the past quarter-century were participated in and looked for with anxiety by many young men year after year when springtide arrived. He has gathered and classified one of the most complete herbariums of Wisconsin plants in existence.

Mr. Conrath's untimely departure from a field of usefulness is a great loss to the profession of Pharmacy, and is sincerely deplored by all who had the pleasure of knowing him. He is survived by a widow and two infant children.

Deceased became a member of our Association in 1881, at the meeting held in Kansas City, Mo.

Charles C. Coombs, of Boston, Mass., died suddenly at his apartment in Hotel Westland, Westland Ave., that city, on January 3, 1902, of acute laryngitis and asthma, aged forty years. Coombs was a sufferer for throat trouble for some years, but at no time was it thought to be of such a nature as to finally result in his death. He was a native of Maine, many of his relatives residing in Portland. After receiving a good common-school education, he commenced the study of pharmacy, and displayed much aptness in his studies, which, together with the neatness and thoroughness of his work, won to him the confidence of his employer. In 1886, he established a drug store on Massachusetts avenue, when that locality, now the center of Symphony and Horticultural Halls, was regarded as a barren waste, and through his irrepressible vitality and energy made it a lucrative business. As a disciple of his chosen profession, he was industrious and persevering, and stood always ready to promote its interests. As a business man, he knew his business from beginning to end and was constantly abreast of the times. He was likewise charitably disposed; his sympathy was boundless. He was held in the greatest esteem by all his friends and acquaintances. His equable temper, as well as his love of making things bright around him, was one of the chief causes of his success. He was unmarried.

Deceased became a life member of our Association in 1897, at the meeting held at Lake Minnetonka, Minn.

Eugene Du Puy, of Detroit, Mich., one of the founders of our Association and the last survivor of the little group of pharmacists which organized the same in 1852, died at his home in that city, October 20th, aged 84 years.

Mr. Du Puy's eventful life began in the Alps of Switzerland, September 17th, 1817. Thirteen years of it had already been spent when he entered upon his pharmaceutical career at Jura, in the laboratory of a manufacturing pharmacist and perfumer. After several years spent in this establishment he came with his family to America, and after learning to speak English succeeded in obtaining a position in a New York drug store. His natural ability soon gained for him recognition here, and he was made a trustee of the New York College of Pharmacy. It was while holding this position that Mr. Du Puy took a prominent and active part in the movement which resulted in the formation of our present Association. In his younger days Mr. Du Puy was a valued contributor to pharmaceutical literature, and that he did not lose his interest in such matters in his old age is testified to by the fact that at the recent meeting of the Association at St. Louis, he contributed a formula to the Section on Practical Pharmacy and Dispensing. He was in business for himself at 609 Broadway, and prospering, when he met and married Miss Sprague, of Detroit. Miss Sprague was a famous singer, and had come to New

York to study vocal music. Mr. Du Puy was also a musician, and so the meeting and the marriage came about. The wife who for nearly a half century had traveled life's pathway with him survives.

Mr. Du Puy was a cultured, attractive, splendid gentleman, a man of genial disposition and courteous manners, broad-minded, liberal and sympathetic, pure in mind and heart and clear in speech. He labored successfully for nearly a lifetime to raise the standard of pharmacy and his efforts were well crowned with success. In his old age he still remained a cherry, well-preserved man. His fond hope was that he might be able to be present at the golden jubilee of the Association which he helped to organize. By his death the Association loses a unique and distinguished personage.

Deceased being one of the organizers of the Association, naturally became identified with the same in the first year of its existence, 1852. He was a life member of our Association.

George Gill, of Mt. Vernon, N. Y., was one of the most prominent pharmacists of that place. Through his energetic application to school duties, he gained the approbation of his teachers and all in a position to note the ambitious youth's progress. Having served an apprenticeship with one of the best apothecaries in that section, he subsequently entered into business for himself and conducted the same with remarkable skill and ability and soon established one of the most lucrative establishments in Mt. Vernon. He manifested a great interest in the various branches of pharmacy, and was a strong advocate of a higher standard of qualification for those entering the profession. His energy, prudence and foresighted broad-minded policy caused his business to expand in a marvelous fashion. His advice on matters of business and public good was always ready and always valued. Through his courteous and genial ways, he made friends with all with whom he came in contact. He was an indefatigable thinker and careful worker, and won the confidence of his many patrons.

Deceased became a member of our Association in 1872, at the meeting held in Cleveland, Ohio.

Adam J. Gosman, one of the oldest and best known druggists of Baltimore, Md., died on November 7th, 1901, of heart failure, at his home, 344 N. Charles St. Mr. Gosman was born Aug. 21st, 1831, in the town of Frammersbach, Germany, being the fifth of seven children born to Andrew and Anna Maria Gosman, and the youngest of three sons. The family left Germany and came to America, sailing from Bremen for Baltimore on Aug. 31st, 1833, arriving in this country about the end of the following month. Most of his earlier life, until grown, was spent in Adams County, Penna., his parents having gone there from Baltimore soon after their arrival in America. After the death of his father, which occurred in 1847, he came to Baltimore, and later brought his mother and sisters to this city. Shortly after this he entered the employ of Dr. Thomas Mackenzie, a noted pharmacist of that day, who kept an establishment on the corner of Baltimore and Gay streets, and in 1860 was placed in charge of the store as manager. He served in this capacity until 1864, when he purchased the respective interests of Dr. Mackenzie and Mr. John Jacob Myer, thereby becoming the successor of the firm of Mackenzie & Co., of which firm Mr. Myer was also a member. He conducted the business at this stand with marked success until he in turn sold out his interest in 1876 to the late Charles C. Habliston, who had entered his employ some years before. In 1867, together with Mr. Myer, he purchased the store No. 191 Madison Ave., and began business under the firm name of Gosman & Co. This store was noted for its costly and elaborate fixtures, and was at that time the most handsome pharmacy in Baltimore. The business at this stand, as in the other case, prospered and attracted the finest patronage. This business was afterwards moved farther up Madison avenue, and finally disposed of to Messrs. Bailey & Long, about 1878-79. On July 15th, 1872, Mr. Gosman, together with Dr. J.

A. Marshall, bought the business corner Charles & Mulberry streets, succeeding the firm of McDaniel & Leamy, from Dr. Leamy, Mr. McDaniel having retired some two years previously. The new firm took charge Aug. 1st, 1872, and began business under the name of Gosman & Co. The business at this time was in a much run-down condition, but under the new management prospered and was soon in a most flourishing state. Mr. Gosman later on purchased Dr. Marshall's interest in the business and ran it under the name of Adam J. Gosman. He was a person possessed of strong sanguine temperament and marked individuality, in fact so much so as to be thought peculiar by those not knowing him well. His eccentricities were often amusing to his friends and acquaintances, but however much he demanded of those around him, he could fully appreciate efficient service, and often while stinting himself, was liberal to a degree to others. He was a man of undoubted integrity, and valued his good name and honor above all things. Mr. Gosman traveled extensively both in this country and Europe. He returned from Europe two weeks before his death and was taken seriously ill the night of his arrival home. He was the originator of many valuable formulas, among them being the "Gosman Ginger Ale," which has become a famous beverage. Three years ago he disposed of this formula for \$45,000.00. He is survived by a widow and four step-children, Messrs. Churchill B. Roy, of Gloucester Co., Va., and A. H. Roy, of this city, Mr. Walter F. Hoover, of New York City, and Mrs. M. B. Cornish, of Baltimore. Deceased became a member of our Association in 1870, at the meeting held in Baltimore, Md.

Joseph Hammel, of Medford, Wisconsin, was undoubtedly the most popular pharmacist of that place. As a member of the profession, he was a man of eminent professional attainments, and by his death his associates lost an amiable, zealous and sincere colleague. As a citizen he was highly esteemed, being an ardent and ready advocate of everything that looked to the welfare of the town. He was kind and gentle with those he came in contact with in business affairs. Mr. Hammel was notable for his composure under all circumstances, and it is a common tribute that none had ever known him to lose his temper or say an unkind thing. He was distinguished for his charity as he was for amiability, and he was always ready to give substantial proof of it. Deceased became a member of our Association in 1887, at the meeting held in Cincinnati, Ohio.

Henry Haviland, of Brooklyn, N. Y., died at his home in that city, No. 152 Prospect Park West, on September 3, 1902, at the age of seventy-five years. Mr. Haviland was born in New York on June 15, 1827, but spent fifty-nine years of his life in Brooklyn, for a great part of which time he was engaged in the business of importer of druggists' sundries. Beginning business on a small scale, he gradually increased the same from time to time, and through his progressive and enterprising nature, together with honorable business tactics, he established a very prosperous business. He was a man of genial disposition, generous impulses and high social qualities, and during his younger days, took a prominent part in all matters pertaining to the public good. Through his courteous and genial manners he made friends on all sides. He was broad-minded, liberal and sympathetic, and had hosts of friends who mourn his loss. Apart from business his home occupied the most sacred corner of his heart. He leaves a widow and one son, and had been looking forward to the celebration of his golden wedding in November. His loss is keenly felt by his many friends throughout the country. Deceased became a member of our Association in 1857, at the meeting held in Philadelphia, and was a life member.

Otto Heinemann, of Cincinnati, Ohio, one of the pioneer druggists of that city, died at his home, 808 Laurel Street, November 1st, 1901, in the sixty-eighth year of his age. Mr. Heinemann was born in Rinteln near Kassel, Germany, on February 25, 1834. At the age of eighteen he left his native country and came to America with Prof. Adolph

Fennel, who afterwards was looked upon by him throughout life as his best friend, and settled in Cincinnati, Ohio, in 1852, in which place he resided up to the time of his death. Four years after settling in Cincinnati, he purchased the drug business of Langenback & Fennel, on the corner of Linn & Laurel streets, and continued the same to the last. He manifested a deep interest in his chosen profession, and had the reputation of being one of the most conscientious pharmacists in the country. He was held in the highest esteem by all his associates. His honest business traits won for him the confidence of all, resulting in a successful financial career. At the time of his death he was the second oldest pharmacist in Cincinnati.

In 1857 Mr. Heinemann married Miss Marie Stolz, only child of Mr. John Stolz, a pioneer of Cincinnati. A widow and five sons survive him.

Deceased was a member of the Ohio State Pharmaceutical Association, and became identified with our Association in 1864, at the meeting held in Cincinnati, Ohio.

John F. Hescong, of Peoria, Ill., the well-known druggist residing at 1016 North Adams street, and conducting a drug store next door, died very suddenly at his home in that city on June 9th, 1902, from heart disease. Mr. Hescong complained of feeling unwell for several weeks, but at no time was his condition considered serious; therefore when he was found in a dying condition, his death, which followed, proved to be a great shock to his family and hundreds of friends about the city. There were very few business men in the city of Peoria better known and liked more than Mr. Hescong, as he was of that type of man who made friends by his pleasant and winning personality.

John F. Hescong was about 45 years of age, and was born in Hanover, Mo., but afterwards moved to St. Joe, where his mother and brothers and sister live. His father has been dead for a number of years. In 1873 Mr. Hescong came to this city and went to work for Singer & Wheeler, after which he was employed by William Davis. He afterward went to Reen's, where he remained until he bought the drug store he now owns, from a man named Martin. This was in 1881, and since that time he has been building up his business and making friends until, at the time of his death, there was not a drug store in the city enjoying a better trade or a man with more friends than Mr. Hescong. He devoted a great deal of his time and attention towards organizing the local association of pharmacists in Peoria and was subsequently made Chairman of the Board of Control, which position he held at the time of his death.

In 1879 Mr. Hescong was united in marriage at Sheboygan, Mich., to Miss Otila Neindorf, and his wife and three children—two girls and one boy—survive him.

Deceased became a member of our Association in 1896, at the meeting held in Montreal, Canada.

John J. Howey, of Montreal, Province of Quebec, Canada, died in Virginia, where he had gone to recuperate his health at the advice of his physicians, on April 22, 1900, having been suffering for years with liver trouble. At an early age he entered upon the study of pharmaceutical chemistry and pursued the same with such diligence and skill that when quite a young man, he was recognized as one of the foremost in the Province. After completing his studies, he secured employment with the Davis & Lawrence Manufacturing Company, of Montreal, taking special charge of Wyeth's branch of their business. He never entered into business for himself as a retail pharmacist, but nevertheless took a deep interest in pharmaceutical matters, endeavoring always to promote the interests of the profession. He was a man of broad views and generous to a fault, standing always ready to give his help to the needy. He was held in great esteem by all and had many friends throughout the city and Province. He was much liked by his employers. Death cut short what promised to be a successful business life. He was married and had a small family. Deceased became a member of our Association in 1896 at the meeting held in Montreal, Canada.

August P. Kaltwasser, of St. Louis, Mo., died at his home in that city on May 8, 1902, after a long illness, of heart trouble. He was born on July 23, 1855, in St. Louis, and resided there all his life. He received his education in the common schools of that city and at the age of sixteen was apprenticed to one of the best pharmacists in the city, subsequently graduating from the St. Louis College of Pharmacy in 1876. He afterwards served as a clerk for a number of years. In September, 1881, he established himself in business at Salena and Pestalozzi Streets, St. Louis, which place he conducted until October, 1901, when ill health forced him to sell the same and retire. He was married in May, 1882. He is survived by a widow and two sons, another son preceding him in death. He was well liked by all his friends and acquaintances. He was a great lover of home and spent there all his leisure moments. He was kind-hearted in the extreme, and the poor in his vicinity always found in him a ready friend. As a business man he was very successful, and through his honest business qualities won the confidence of all with whom he came in contact. Deceased became a member of our Association in 1901, at the meeting held in St. Louis, Mo.

Edward Kemp, of New York City, New York, head of the firm of Lanman & Kemp, No. 135 Water street, died Tuesday evening, December 24th, at his home, No. 722 Fifth avenue. Death was said to be due to heart disease, though Mr. Kemp, on account of ill health, had not been able to attend to business since December 2d.

Mr. Kemp was born in Ireland seventy years ago, and came to this country in boyhood with his widowed mother. His first experience in the business world was in 1847, with Hussey & Murray, at Old Slip. He later went with W. H. Halsey, a shellac importer who had a store on Burling Slip. Here he became familiar with the East Indian trade and was recognized as an expert in shellac, indigo and East Indian products. In 1870, he became associated with his late brother George, in the firm of Lanman & Kemp, his knowledge of commercial affairs and accurate judgment assisting greatly in making the business highly successful. It was he who built the fine building at No. 135 Water street, in which the firm's offices are now located. Mr. Kemp was for several years president of the New York College of Pharmacy, and contributed to the treasury of that institution on several occasions, besides donating to the laboratory equipment and supplies from time to time.

His summer home was at Remson Road, Monmouth county, New Jersey, where he was known for his liberality toward the various churches, irrespective of denomination.

Mr. Kemp was a familiar figure in the district below Fulton street for over fifty years, and was well known as a philanthropist. He leaves a widow.

Deceased became a member of our Association in 1888, at the meeting held in Detroit, Michigan.

Albert A. Laing, of Cambridge, Mass., died suddenly at his home in that city on November 1, 1901. In the morning he was about his pharmacy as usual for several hours, when he was taken ill and fainted. A physician was summoned, and it was found that he was suffering with heart trouble, expiring shortly afterwards. Mr. Laing was born in St. John, New Brunswick, and was forty-two years of age at the time of his death. When a young man he entered upon the study of pharmacy with a persistency rarely excelled, and at the age of twenty-seven embarked in business for himself in Cambridge, where he came during his early years. He soon built up a prosperous business which he conducted for a period of fifteen years very successfully. He was a man of fine presence and magnetic manners, and was one of the most prominent druggists in the city. Aside from business, he displayed a great interest in the welfare of the town, taking a prominent part in all public movements, while serving as a member of the Citizen's Trade Association. For a number of years he was an important factor in politics. He is survived by his wife and one son.

Deceased became a member of our Association in 1888, at the meeting held in Detroit, Mich.

William Martindale, F. C. S., F. L. S., of London, England, an honorary member of our Association, died at 19 Devonshire, Portland Place, W., on February 2, 1902, aged sixty-one years. Mr. Martindale was born near Carlisle in 1840, and was apprenticed with the late Mr. Andrew Thompson, Carlisle. The apprenticeship was of a practical nature, and Mr. Martindale has often related how with his apprentice-master early morning rambles were made in search of henbane and dandelion for the manufacture of galenicals. This early acquaintance with botany doubtless gave him the strong leaning to the botanical side of pharmacy, which came out strongly in after life. Mr. Martindale came to London in 1862 as an assistant at Merrell's in Camden Road, and was afterwards with Messrs. Morson & Son, Southampton Row, W. C., where he remained for some years, attending in the early part of his career a course of lectures at the Bloomsbury Square School. He passed the Minor examination in July, 1864, and the Major on October 17, 1868, taking honors in the latter. In 1868 he was appointed dispenser and teacher of pharmacy at University College Hospital, where he remained till he took over the retail branch of Messrs. Hopkins & Williams, 10 Cavendish Street, W., on May 23, 1873, retaining, however, for a short time a position as demonstrator of materia medica to the college. He joined the Board of Examiners of the Pharmaceutical Society in 1872, taking the place of Mr. Augustus Bird, and was an examiner until the end of 1882. In May, 1889, he was elected a member of the Council of the Pharmaceutical Society, being placed at the top of the poll, and it is an index of his popularity with pharmacists that in subsequent elections he was usually returned in that position. He was appointed Treasurer in the early part of 1899, when Mr. Hampson resigned, and in June, 1899, succeeded Mr. Walter Hills as President. At this time Mr. Martindale's health was far from robust, some cardiac trouble giving him considerable annoyance, not to say anxiety, and it was not, therefore, surprising to his friends that before the end of the year of office he was ordered a complete rest. The Vice-President (Mr. Newsholme) had to take his place at the annual meeting in 1900. Mr. Martindale's prescription when not feeling in good health was a sea voyage, and in these journeys he never failed to investigate the materia medica of the countries he visited. A visit to Egypt in 1889 resulted in a paper on Egyptian opium, and in 1899, when he visited the West Indies, he communicated to the Royal Botanical Society a note on Barbadoes aloes and Tous les mois. In 1900 he visited South Africa, and on leaving for England was entertained at dinner by the Cape Pharmaceutical Society. Mr. Martindale was early connected with the British Pharmaceutical Conference. He was elected a member at the Exeter meeting in 1869, and was at once put on the Executive Committee. On the formation of the Formulary Committee in 1886 he was appointed Chairman. From 1888 to 1890 he was Treasurer of the Conference, and in 1891 and 1896 filled the office of President, the state of his health not permitting him to take the presidency in 1892. It is curious to note that the two years that he was President were the only occasions on which the Conference has been welcomed to the town by a peer: in 1891 the late Marquis of Bute was Mayor of Cardiff and welcomed the Conference, and in 1896 the Earl of Derby, as Lord Mayor of Liverpool, similarly acted in that city. When the Conference met in London in 1900, Mr. Martindale was Chairman of the local committee, and with his wife and daughter received the visitors at the garden party at the Royal Botanical Gardens. Mr. Martindale was one of the members of the committee appointed in 1895 by the Pharmaceutical Society at the request of the General Medical Council to assist in the revision of the Pharmacopœia. He took an active part on the committee, and made a large number of experimental preparations in his own laboratory in connection with this work. In July, 1901, the Privy Council appointed Mr. Martindale to represent the Pharmaceutical So-

ciety on the committee to inquire into the necessity for alterations in the poisons schedule. He was suited better for the pleasant ways of the art of pharmacy rather than the worry of politics. He had the student's mind more fully developed than that of the statesman, so we find his record a large one in pharmaceutical literature. Besides in 1872 he edited the University College Hospital Pharmacopœia, and in 1883 published the now well-known "Extra Pharmacopœia," being assisted in the medical notes by Dr. Wynn Westcott. The tenth addition, brought out May, 1901, has considerably over double the number of pages that were contained in the first edition. The book undoubtedly did much to make his reputation outside the British Isles. When cocaine was all the rage fifteen years ago he wrote a little work on "Coca and Cocaine," which has gone through four editions. He was one of the original contributors to "The Art of Dispensing," and kept up his interest in it, frequently sending little notes and suggestions for its improvement. In spite of his numerous engagements Mr. Martindale found time to interest himself in municipal life, and was Mayor of Winchelsea in 1893, where he had a family residence and considerable property. He also had archaeological tastes and possessed a small collection of ancient pharmacy vases and Egyptian antiquities. He was most methodical in his arrangements, a fact which largely accounts for the varied interests which he attended to, and kept all his correspondence from his youth. Mr. Martindale was a man of handsome presence, and the picture of health and energy when he was well. He was kindness itself, and a perfect mine of information on pharmaceutical topics. He had traveled much, and has been honored by pharmacists of several countries. A widow, two sons and two daughters survive him.

Deceased was elected an honorary member of our Association in 1898, at the meeting held in Baltimore, Md.

Gerhard Mennen, of Newark, N. J., died at his home in that city on February 3, 1902. Death was due to blood poisoning, caused by an operation on a carbuncle on his neck about two weeks before. Mr. Mennen was born in Bremen, Germany, in 1857, and came to America when a boy. He studied the drug business in Newark, and afterwards for about twenty-five years conducted a pharmacy in that city. Several years ago he sold out the store to devote all his time to the manufacture of his talcum powder, that has a universal reputation. A short time before his death a large company was formed for the manufacturing of this article, of which Mr. Mennen was one of the heaviest stockholders. This manufacture of talcum powder proved to be an advantageous venture in a pecuniary way, and added considerably to Mr. Mennen's possessions. His success in life was due to his alert, progressive and enterprising nature, being at all times abreast of the times and ready to grasp at a good opportunity when the same presented itself. He was strictly honest, fair and conscientious in all his business dealings. He was a public spirited citizen, and was for many years a member of the Newark Board of Trade. His good nature and ready wit won to him many friends who remained constant throughout life. Through sheer merit he carved his way to success, and his unexpected death at the age of forty-five came as a sudden blow to his many friends throughout the country. He is survived by a widow and two children.

Deceased became a member of our Association in 1888, at the meeting held in Detroit, Mich.

Thomas S. Moffit, of San Francisco, Cal., died in that city on September 29, 1901, after a lingering illness of four years, at the age of seventy-two years. Mr. Moffit was born in Dublin, Ireland, on August 21, 1829. At the age of eighteen he came to this country and located in Boston, Mass. When quite young he entered upon the study of pharmacy and pursued his course with great diligence and success. Completing his apprenticeship, he engaged in the practice of pharmacy with several prominent druggists in Boston and vicinity for several years. In the early 60's he went west and located in

San Francisco, Cal., and in 1864 entered the employ of Redington & Co., wholesale druggists, as superintendent of their laboratory, where he remained fourteen years. Severing his connections with that firm, he engaged in business for himself as a manufacturing chemist, which effort was crowned with great success. After conducting the business for a number of years Mr. Moffit retired twelve years ago, and has led a quiet life ever since. He was a man much honored, admired and respected by all. His genial disposition and courteous manner won to him a host of friends who remained devoted to him throughout his entire life.

Deceased became a life member of our Association in 1861, and was one of its oldest members.

Charles A. Osmun, of New York City, N. Y., one of the most prominent retail pharmacists of that city, died on December 29, 1901, of dropsy, after an illness of five months. Mr. Osmun was born at Hagerstown, N. J., in 1846, and obtained his first experience in the drug business with J. N. Hegeman & Co., No. 793 Broadway, where he remained for a period of nine years, serving his employers faithfully. While so engaged he made many friends on all sides, and it was with deep regret that he severed his connection with the firm. Possessing a good education and being well adapted for a successful business life, he purchased the business of Valentine Hammond, at No. 13 Seventh Avenue, which store he conducted until health forced him to retire in the fall of 1900. As a druggist he was highly successful, and by his integrity and honesty in dealings, commanded the respect and confidence not only of the people, but quite a number of physicians, resulting in a large prescription trade. He was a man of positive convictions, and his word on all matters was as good as his bond. In private life his home occupied the most sacred corner of his heart, devoting all his leisure moments to his family. A widow and two daughters survive him. He was a member of the Manhattan and New York State Pharmaceutical Associations and the New York College of Pharmacy.

Deceased became a member of our Association in 1868, at the meeting held in Philadelphia, Pa.

Louis W. Sauer, of Cincinnati, Ohio, was born in 1861, and, after attending the public schools of that city, entered upon the field of pharmacy, commencing at the very bottom of the ladder. His days of apprenticeship were spent with such men as William Boettger, Carl Jungk and August Schaeffer, men who had received their professional training at the best universities of Europe; men who worshiped pharmacy for its scientific sake; men who sacrificed time, labor and money to establish and maintain a high standard of American Pharmacy. Young Sauer grasped the opportunities presented to him through these able teachers, and after five years' training with them, entered the Cincinnati College of Pharmacy, from which institution he graduated with honors. His abilities and qualifications being recognized, it made him master of clerkships. In his selection he aimed at securing positions with men of recognized ability, and that he chose wisely, may be seen from the names of those whom he served. Among these we find the names of G. A. Zwick, of Cincinnati, T. J. Casper, of Springfield, and Otto E. Bettz, all of whom he served faithfully until he entered upon the field on his own account, on the corner of Baymiller and Central Avenue. Soon thereafter the Cincinnati College of Medicine and Surgery established a course on Pharmacology, which was placed in the care of Mr. Sauer. He held the professorship until his resignation, in 1896, when he accepted the chair of Materia Medica and Toxicology at the Cincinnati College of Pharmacy. Unfortunately business interests compelled Mr. Sauer to withdraw after one year of creditable service. Mr. Sauer was at all times active, energetic and ambitious in the common cause of welfare to the pharmacist, and never failed to meet the demands made upon him. A family, consisting of a wife, two daughters and one son, mourn their loss.

Deceased was an active member of the Alumni Association of the Cincinnati College of Pharmacy, the Ohio State Pharmaceutical Association and the American Pharmaceutical Association, becoming identified with the latter in 1882, at its meeting held at Niagara Falls, N. Y.

Albert C. Schumacher, of Ann Arbor, Mich., died at his home in that city of pneumonia, after an illness of only one week, on March 16th, 1902, at the age of forty-three years. It was while attending a meeting of the Board of Pharmacists at Grand Rapids, Mich., that Mr. Schumacher contracted a cold which subsequently developed into pneumonia, and, notwithstanding a brave fight for life, succumbed to the dreaded disease.

Mr. Schumacher was born in Ann Arbor, on July 15th, 1858, and received his early education in the high school of that city. At an early age he exhibited a preference for the study of pharmacy, and entered the drug store of Christian Eberbach & Son. While employed at the latter place, he matriculated in the Department of Pharmacy of the University of Michigan, from which institution he graduated in 1884. He remained with his old employer for a period of twenty-one years, during which term he served in various lines of pharmacy, from the prescription counter to the purification of chemicals in the laboratory. For a long period of time he was chiefly engaged in the chemical supply department.

In 1896 he started in business for himself as a dispensing pharmacist with his brother-in-law, Herman Miller, in the city of Ann Arbor. In the fall of 1901 the partnership was dissolved, and the business passed solely into his hands.

Mr. Schumacher was a strong and effective supporter of the interests of his Alma Mater, and for some years served as Secretary of the Alumni Association. In all things pertaining to the advancement of his chosen profession, he could be found in the foremost rank. In 1894 he was appointed a member of the Board of Pharmacy for the State of Michigan by Gov. Rich, and in 1899 was reappointed for a period of five years by Gov. Pingree. Mr. Schumacher was Treasurer of the Board in 1897, Secretary in 1898, and President from 1900 to the time of his death. As a member of the Board he was very diligent and influential, thoroughly practical, of good judgment as to what measures of advancement could be carried out with general advantage, and an earnest and persistent advocate of higher standards of qualification, both in pharmaceutical and in general education.

Mr. Schumacher was married to Miss Clara Andres. His widow and two children, a son and a daughter, survive him. His death was a great shock to his many friends, who had for him the greatest love and respect. The members of the State Board of Pharmacy attended his funeral in a body. He was an active member of the Michigan State Pharmaceutical Association since 1887.

Deceased became a member of our Association in 1900, at the meeting held in Richmond, Va.

William Scott Thompson, of Washington, D. C., died suddenly of heart failure on September 26, 1901, aged 63 years. The news of his death was a great shock to his many friends in the drug business all over the country. Only a few days before his demise Mr. Thompson had been facetiously introduced as Third Vice-President of our Association, as one of the younger members who gave promise of great usefulness.

Mr. Thompson was born in Frederick County, Maryland, February 14, 1838. His father was Judge John Thompson, of the Maryland Circuit Court, and his mother a near relative of Gen. Winfield Scott. He spent his boyhood days on a farm and in the public schools near Urbana, Md. At the early age of twelve years young Thompson secured an apprenticeship in the drug store of Dr. Johnson, at Frederick, Md. Four years later, being as well versed in the business as a young man could be at his age, ambitious, and

of a broad mind, he sought a wider field of operations. Hearing of a vacancy at Washington, D. C., he made his way thither via canal, that being the only means of travel thereabouts in those days. He secured the position, which was in the store of Joseph Kidwell, a famous druggist in those days, on Pennsylvania Avenue between Thirteenth and Fourteenth Streets. After another four years there, during which time he boarded with his employer, Mr. Thompson bought the store of John W. Nairn, at the corner of New York Avenue and Fifteenth Street, opposite the United States Treasury, and in view of the White House. After successfully conducting the business at this stand for five years, Mr. Thompson purchased the adjoining property, known as 703 Fifteenth Street, and continued in business there until the time of his death.

Mr. Thompson was a model man, of even temper, with a kind and pleasant word for every one. There was no malice in him: he was always forbearing and tolerant of the opinions of others who differed with him. He was slow to express his opinion, but when his mind was made up it was firm and unchangeable. He was true to his friends, affectionate to his family and those near him, and withal of the strictest integrity and honor. He was intelligent, moral, temperate in all things, forbearing and patient, and charitable for the defects or weaknesses of others. With an open heart and willing hand to assist those in trouble or distress, he was wise and sagacious in business, public spirited and in touch with every effort for public advancement, extremely modest and unassuming, shunning show and publicity.

He became a member of our Association in 1871, at the meeting held in St. Louis, Mo., being then but 33 years old. In 1874 he was assigned to duty as a member of the committee on papers and queries. From that time until his death he was serving the Association in some capacity or other, continuously. Mr. Thompson was a good worker, and the Association needing his services, and calling on him for them, was not turned away. In 1880, when the Council of the Association was established, and Mr. Thompson, who had already distinguished himself as a member of the executive committee, as a member of the committee on United States Pharmacopœia, by papers read, and in other matters, was elected second vice president, and so became, *ex-officio*, a member of the first Council. In 1883, at a meeting of the Association held at Washington, Mr. Thompson was elected President. He was the chairman of the committee which secured the incorporation of the Association in 1888. Prior to 1894 Mr. Thompson had been a member of the Council for a number of terms, serving it as vice-chairman three years and as chairman one. Since 1894 he had been chairman of that body continuously. As an elective member of the Council cannot succeed himself, Mr. Thompson was made an *ex-officio* member by being elected second vice-president in 1897, and third vice-president this year, in order that the Association should not be deprived of his clear head and guiding hand at the helm of its executive body. In addition to the matters already mentioned, Mr. Thompson has done good work on various important committees, and as delegate to other associations. When the United States Pharmacopœial Convention was incorporated last year, and its business management put into the hands of seven men, it was but natural that Mr. Thompson's rich experience and proven ability in the American Pharmaceutical Association should have suggested him as a suitable head for that department of the Convention, and he was unanimously elected chairman of the board of trustees of the Convention.

Not only in national, but in local pharmaceutical work was Mr. Thompson's counsel sought. He was one of the originators and founders of the National College of Pharmacy at Washington, as well as a prominent member of the Pharmaceutical Association of the District of Columbia.

In the industrial and charitable affairs of the District, Mr. Thompson was always to be found in the forefront, having been president of two fire insurance companies, a director of a trust company, treasurer of the Children's Hospital, and trustee of the Boys' Reform

School. Mr. Thompson is survived by a widow, formerly Miss Tucker, of Washington, and five grown children, who are W. S. Thompson, Jr.; Lieut. Fred. Thompson, U. S. N.; Mrs. Thomas J. Fisher, Jr.; Mrs. Von Phul Jones, of Wissahickon, Pa.; and Miss Mabel Thompson.

The American Pharmaceutical Association and the U. S. Pharmacopœial Convention were represented at his funeral by Charles E. Dohme, H. P. Hynson, Geo. L. Muth and Charles Caspari, Jr., Baltimore; Joseph P. Remington, Philadelphia; John F. Patton, York, Pa.; Dr. Murray G. Motter and Dr. William M. Mew, Washington, and others.

Frank H. Vonachen, of Peoria, Ill., died at his home in that city on January 11th, 1902, of locomotor ataxia, from which he had suffered for several years, aged thirty-seven. Receiving a good education he entered upon the study of pharmacy, completing his course at College, from which he graduated in 1885. He subsequently embarked in business for himself at Green and Adams streets, and conducted the same for a period of twelve years. He was a gentleman who stood in high esteem in the professional and business circles of the city. He was very popular and much esteemed by all. As a disciple of his chosen profession he was industrious and persevering and established a very successful business. Possessed of a noble character, refinement of feeling and high social qualities, he labored with strenuous zeal in his chosen profession, and rose to prominence solely through his own interest and exertions. He was broad-minded in business affairs; frank and affable with his friends and acquaintances; and in touch with every effort for the promotion of the profession. Being a sufferer himself for years, his sympathy for others was boundless, and when an opportunity to show his generous hand manifested itself, he was not slow to do it in a material way.

Deceased became a member of our Association in 1898, at the meeting held in Baltimore, Md.

In conclusion, your Secretary desires to thank the officers and members of the Association for the many courtesies extended to him during the past year, by furnishing information and data on various matters when asked, all of which tends to make the duties of his office less irksome.

Respectfully submitted,

GEO. W. KENNEDY,
Secretary of Committee on Membership.

Mr. Nattans moved to receive and adopt the report, and the motion prevailed.

THE SECRETARY: Mr. President, supplemental to this I have in my hand a report from the Committee on Membership, signed by the chairman of the committee, and this should be considered in connection with the secretary's report. It deals with matters not identical with those contained in the report just read, and also contains one or two recommendations.

The Secretary then read the last paragraph but one of the report published below, containing a recommendation as to change of the by-laws affecting the reinstatement of members dropped for non-payment of dues.

The report in full was then presented for action.

THE PRESIDENT: The report of the Chairman of the Committee on membership is before you, making a recommendation which is already being considered by the Council. This recommendation could, with propriety, be referred to the Council.

Mr. Searby moved that the report be received, and the recommendations referred to the Council, and it was so ordered.

The full text of the report was as follows :

REPORT OF THE COMMITTEE ON MEMBERSHIP.

Your Committee begs leave to make the following report, although the by-laws require a report from the Secretary of this Committee, which is and always has been a very able and interesting report. It, however, relates more to our present membership, and to the list of deceased, suspended, and resigned members.

The membership as represented in a few of the States which are supposed to be drug centers is as follows :

New York has one hundred and forty-nine members, of which number New York City has seventy-two and Brooklyn thirty-one, Buffalo and Albany each six, giving the State thirty-four members outside of the cities above named.

Massachusetts has ninety-one, Boston forty-three, balance of State forty-eight.

Maryland has sixty-six; Baltimore fifty-seven, balance of State, six.

Pennsylvania has one-hundred and eleven, of which Philadelphia has sixty-four, Pittsburgh six, giving forty-one for balance of the State.

Ohio has seventy-four, of which Cincinnati has eighteen, Cleveland twenty, Columbus thirteen, balance of State twenty-three.

New Jersey has forty-four, of which number Jersey City has six and Newark four, twenty-seven in balance of the State.

Kentucky has twenty-one, of which Louisville has fourteen, and seven for the balance of the State.

Indiana has thirty-two, of which Indianapolis has twelve, twenty for the balance of the State.

Illinois has eighty-one, Chicago fifty-two, twenty-nine for the balance of the State.

Michigan has twenty-five, Detroit fourteen, Ann Arbor five, balance of the State six.

Missouri has one hundred and four, of which sixty-one joined during the year 1901. St. Louis has seventy-six, balance of the State twenty-eight.

This shows a very small per cent. of the druggists as members. The teachers of Pharmacy are well represented in our membership, and why? They well know that the annual report published by our Association is to them one of the most valuable books of reference obtainable. They are and must be constantly on the alert for everything that is new relating to Pharmacy, consequently they seek membership in our Association if for no other reason than to get the annual report. How is it with the druggist in actual practice? The policy of the Association has been to invite druggists to join its membership. The busy druggist pays but little attention to an invitation; he must be gotten after and shown that it is to his interest as a progressive and up-to-date pharmacist to be a member of our Association. He must be shown that the Report is very necessary for the proper conducting of his business. Now, gentlemen, there is only one right way to get members—go after them.

The future welfare of our Association depends more on a large membership than anything else. A large membership means a full treasury, and with a goodly supply of money the Association can go right ahead without the question being asked, "Have we the funds at hand?"

Your Chairman decided to go after them. On account of the Committee not being able to get together and to save all the time possible, the Chairman took it upon himself to divide the country into sections having a given number of states adjacent to the state in which a member of the Committee resides, with the request that he go after new members in his section for the American Pharmaceutical Association. The next proposition—how to interest the druggists in the American Pharmaceutical Association mem-

bership—after numerous attempts at formulation it occurred to your Chairman to offer a prize to the druggist presenting the best "Ten Reasons Why" a druggist should join the American Pharmaceutical Association. The more it was thought of the more practical seemed the idea. Writing to our President, Dr. H. M. Whelpley, he heartily coincided and agreed to act as judge. Time now was growing shorter and shorter. The proposition was formulated and sent to all pharmaceutical journals with request for publication, which request was happily granted. After replies were all in they were sent to Dr. Whelpley. He decided on the paper signed F. Ordough, written by Mr. Bruno Batt, of St. Louis.

TEN REASONS WHY A DRUGGIST SHOULD BE A MEMBER OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

1.—THE PROCEEDINGS OF THE ASSOCIATION.

The volume of proceedings of each annual meeting, from a practical and scientific standpoint, is the most valuable of all pharmaceutical publications. It is strictly up-to-date, and embraces every conceivable feature of modern American Pharmacy.

2.—RANKS HIGHEST.

Unquestionably the Association is entitled to the first rank among the pharmaceutical associations of the country by virtue of its personnel, its age—it is fifty years old—its permanence and stability, the latter being guaranteed by science, art and commerce.

3.—FREE TUITION FROM BEST AUTHORITIES.

The recognized authorities of the profession are at the head of the Association, and freely and willingly impart their knowledge to the members. This Association is the source and origin, the author and publisher, the conservator and revisor of the National Formulary. It is the controlling factor in the revision of the U. S. P. Here is the parent and tutor of American Pharmacy.

4.—MEMBERSHIP AND HONOR.

The honor to be found worthy of personal and intellectual association with the great men of national and international reputation cannot be refuted by any ambitious person related in any way to pharmacy.

5.—MEET THE HEADS OF PHARMACEUTICAL COMMERCE.

The liberality of purpose and the aims of the Association afford the members the only opportunity to mingle with the representatives of all branches of *commercial* pharmacy, as well as scientific, and improve thereby.

6.—ADVANTAGES OF INTERNATIONAL, STATE AND LOCAL ASSOCIATIONS COMBINED.

a. The best element of each state and local association is gathered here in one grand assembly, adorned with the most noted foreign honoraries in pharmacy, presenting at once the progress and success and results of so many individual societies.

b. Does not honorability and gratitude command that the druggist whose vocation and trade derive so many benefits contribute his share to maintain and expand this association?

7.—LIBERAL INDUCEMENTS TO STIMULATE PROGRESS OF YOUR BUSINESS.

The Ebert fund, the Centennial fund, the Herman Hager memorial prize, the John M. Maisch prize, provide for substantial recognition of meritorious papers and stimulate pharmaceutical progress.

8.—ONE AND ONE-TENTH CENT PER DAY PAYS FOR MEMBERSHIP.

The meetings of the American Pharmaceutical Association are a source of great pleasure and a much-needed diversion from the daily strain of the average pharmacist's life. It is the annual outing for him and his family, at a smaller expense than the usual vacation. Membership costs you 1-10 cent per day.

9.—BROADENS THE MEMBERS AND ELICITS FRATERNITY.

The spirit of fraternity, congeniality and sociability which prevails throughout the American Pharmaceutical Association is greatly conducive to making its members broad-minded. The intermingling of brother pharmacists and their families has done and is doing a great deal toward overcoming any existing prejudice against locality, race, sex or religion.

The North and South, the East and West, are meeting on a common platform. The betterment of the calling is the one aim that actuates and cements all comers. We learn and admire by personal contact the laudable habits and traits of Americans residing in parts of the country remote from us.

In the business of this Association the latent talent is called out for useful applications. Opportunities are plentiful for the writer, the orator, the debater, the teacher and the student, and the intelligent observer.

10.—A MAN'S DUTY TO HELP OTHERS.

If none of the above reasons appeal to you strongly enough to become a member of the American Pharmaceutical Association, remember that one of the sacred duties which are placed upon you while on this earth is to support the laudable undertakings of your fellow-man.

Through the kindness of Dr. Whelpley, the printing of 10,000 copies of Ten Reasons Why was attended to by him. They were distributed to all interested in increased membership. A copy of the Ten Reasons and an application blank was enclosed with each letter sent to members, urging them to do their share towards securing a new member. These letters were followed shortly after by a reply postal card, inquiring as to the success the recipients had in securing that new member. Of the many replies received, the following are a fair sample of those unsuccessful: Promises only. Haven't got him yet. No. Always trying, not successful. Too many drug associations looking for new members. Every member added to the American Pharmaceutical Association would mean one less for our State Association.

1st. Because I want to be the only up-to-date pharmacist in this town.

2d. Because I want to be able to say I lead; let those who can follow.

3d. Because if I do get some fellow to join, he would get the same information that I get at the same cost.

4th. Because the Association ought to charge my competitor \$10 initiation fee, so that his expense would be larger than mine.

The following we present to you, and it is our hope that the Association will give the same careful and favorable consideration, as we think this is one long step towards our increased membership. It was Mr. Arny's intention to present this subject in the form of a paper before the Section on Education and Legislation, but as he expects to leave Friday, before the Section holds a meeting, your Chairman prevailed upon him to let it go in as part of his report, and thereby bring the subject before the Association at its earliest session.

DEAR MR. HOFF: Agreeably to your request, I herewith present, in condensed form, a paper intended for the Section on Education and Legislation of the American Pharmaceutical Association.

In considering the question of a prize to be offered the members of my future classes, showing pharmaceutical excellence, I concluded that the most valuable form the prize could take was a membership in the American Pharmaceutical Association: it seeming highly desirable that this class of men should become interested in our Association at the commencement of their career.

This led to statistics as to membership of our Association among prize-winners; and examination of the published records of ten of the leading schools of the country shows that during thirteen years—from 1889 to 1901 inclusive—441 graduates were awarded prizes, ranging from a certificate to a hundred-dollar bill. Of these 441 graduates, but 32 are members of our Association, and 12 more, while no longer members, have been allied to the Association at some time since their graduation. This means that only 10 per cent. of the prize-winners have joined the Association and that only 7.2 per cent. are members at the present time.

Does not this suggest a fertile field for the Membership Committee? Let the Committee circularize the schools of pharmacy in endeavor to persuade the donors of prizes to change their gift into its monetary equivalent in Association membership. Let the Association encourage this effort by preparing a special prize certificate of membership, said certificate to be paid for by the donor. Think what a benefit membership in our Association would mean to these young men just starting out in life! Think what an accession to our membership would be these 441 young men as against the 44 of them who have joined our body.

Respectfully,

H. V. ARNY.

Two cases have been brought to the notice of your Committee, of druggists who at one time were members of our Association and were dropped for non-payment of dues—they would join again, and, we have every reason to believe, make good members if it were not that they would have to pay \$20. According to our By-Laws, a member failing to pay dues for three years is dropped from membership. This same member, however, does not receive an annual report after failure to pay one year. Therefore, we think it no more than fair that any member, after being dropped, can become a mem-

ber again after paying one year of his lapsed dues and the payment of the annual dues, as required of any one making application. We make a recommendation that Article I, Chapter vii of the By-Laws be so amended as to cover this point.

We wish to make special mention of the valiant service rendered by our worthy President, and the hearty co-operation of Mr. J. W. T. Knox, Chairman of the Auxiliary Committee on Membership.

For the Committee,

LEWIS C. HOPP, *Chairman*.

Mr. Knox, Chairman of the Auxiliary Committee on Membership, was called on to make report for his Committee, and presented the following :

REPORT OF THE CHAIRMAN OF THE AUXILIARY COMMITTEE ON MEMBERSHIP.

The Auxiliary Committee on Membership consists of 72 persons, representing every state and territory, the Canadian provinces and the principal cities. We have carried on an active campaign for new members this year since about the 1st of April, the exact results of which cannot be stated because many of the applications received have not passed through the Chairman's hands, being sent direct to the Secretary of the Committee on Membership, either by the candidates themselves or by the members of the Committee. More than 200 new members have been added, through the combined efforts of the Committee and those who volunteered to assist.

Careful examination of the records shows that a considerable proportion of new members received heretofore were of little value to the Association because they soon dropped out, and consequently the Association was of little value to them. Your Committee has endeavored this year to solicit membership among those most likely to prove permanent members. Whether we have succeeded in this or not can only be determined a year or two later.

At the close of two years' service on this Committee I wish to present a suggestion for increasing the membership, prestige and influence of the Association. Since it may seem to some of you to involve a too radical departure from the established order, I wish to ask your careful attention to the reasons that have prompted me to offer it.

The American Pharmaceutical Association has never had enough members to carry on the work it wishes to do, and as its membership is to-day smaller than it was twenty years ago, the statement that we need new members will not be seriously questioned.

That the Association has shown impaired vitality during the past few years, must be apparent to any one who has taken the trouble to compare the records with those of other organizations devoted to allied sciences. The country entered upon a period of great prosperity nearly six years ago, in which druggists have shared well. Prices are better, and they ought to have felt able to join the American Pharmaceutical Association in larger numbers than ever; but instead of this the Association has steadily dwindled in membership during that period. While the rest of the country was prosperous, and sister societies such as the A. M. A., the A. C. S. and the A. A. A. S. were making good gains in membership, our members were dropping out.

The most serious symptom is the annual loss of ten per cent. of our entire membership by resignation and non-payment of dues. That we should have difficulty in securing new members may be, and doubtless is, an unfavorable indication, but to me it is not half so bad as the fact that after we get new members we are unable to hold them. One-third of our new members never pay more than one year's dues; one-fourth of the remainder drop out after paying their second year's dues; so that we lose approximately half our new members inside of two years. Some loss in this way is inevitable, it must be conceded, for with our present methods of obtaining new members, a considerable propor-

tion join with but a vague, if any, conception of the character, purposes and benefits of the Association. But it is equally true that the loss ought to be small, perhaps only a trifle greater than the loss by death.

We need new members, but it is hard to get them. Many druggists are apathetic; this has been found true by our sister organization, the National Association of Retail Druggists, which promises large material returns for an investment of fifty cents a year. It is not strange then that we should find it so, since we cannot promise such things and our fee is ten times as great. But many druggists who profess admiration for and sympathy with the American Pharmaceutical Association decline to join because they say they do not see where they themselves would get any material return for their five dollars. If we mention the Proceedings to them, they say, "All I care for in that, I get in my drug journals for two dollars a year."

No plan for increasing the membership of the American Pharmaceutical Association can be truly effective that does not also contemplate the necessity of retaining a firm hold on both new and old members. That the Association does not succeed in holding its members is a matter of record, and as I have said, is to me indicative of a very grave defect in our system, that should be remedied if possible.

Although I have made nothing like a general investigation of the causes which influence members to allow their membership to lapse, I have learned from quite a number of them that it was not so much a matter of economy as it was a lack of interest. Some said they did not see what they were getting for their money except the book, which they could hardly persuade themselves was worth five dollars. Some frankly confessed to a loss of interest in the Association, being unable to attend its annual meetings. Still others admitted that the book was of value, yet largely a repetition of matter presented in their drug journals from a month to a year previously, and as such not inviting a second reading. Altogether I am convinced that much good may be done by making a change for the better in this particular.

I, therefore, recommend that the American Pharmaceutical Association begin the publication of a monthly journal of scientific and commercial pharmacy as a substitute for its annual volume of Proceedings, to be conducted as a worthy exponent of the lofty principles of this Association, under regulations to be devised by the Council. This journal to be sent to each member of the Association whose dues are fully paid, and to any others who shall pay the regular subscription price.

It is my belief that such a journal properly conducted along ethical lines will do more to awaken the interest of our present membership, and to attract new members, than any other agency we can employ. By this means the official report of each meeting will be placed in the members' hands as promptly as the unofficial reports now are by other journals, and the monthly or semi-monthly visits of the journal will be far more appreciated by the membership than is the receipt of the annual volume which comes out anywhere from two to four months after the meeting is over. However, the unavoidable delay in issuing the volume is not the present trouble; the members now hear from the Association but once a year, unless they attend the meetings, and by the plan I propose their interest would not have time to lag, for the matter in the journal would be entirely new to them, and therefore likely to be of interest. Such a plan would of course necessitate reserving publication of all original contributions for the official journal, and allowing other journals only the right to copy from it. This rule is a fair one and is enforced by nearly all scientific societies having official journals, so far as I am aware.

It is no novelty for a society such as this to publish its own journal in lieu of any other way of recording its transactions. In fact, the practice is so common now that our action in adhering to the present mode has become exceptional. The American Medical Association has for nineteen years published a weekly journal; that association, too, looked askance at the journal idea for some time. But after three years of hesitation it

began in 1883 with a thirty-two page weekly, which has grown to one of seventy-two pages of pure reading matter, making a total of about 3600 pages in the year, and undoubtedly it is the most influential medical publication in this country. These pages are about $2\frac{1}{4}$ times as large as those of our Proceedings, so the member of the American Medical Association gets about nine times as much reading matter for his money as do ours. The cost to their members is the same as ours, \$5 a year. While the journal has doubled in size, the membership has more than quadrupled; yet notwithstanding the large size of the journal, it paid the A. M. A. a net profit of \$36,245 last year, and the Association had left after paying *all* expenses, \$26,000. The Association has under construction a \$70,000 home for the Journal. The plant is worth \$34,000.

Or, if you will, take the Journal of the American Chemical Society, which has been published over twenty-three years, a volume of approximately one hundred pages monthly. In 1889 the membership of the A. C. S. was 204, and the last official report in February gives it as 2,075. Part of the growth is due to the plan of reorganization adopted at that time, by which two general meetings each year are held, and monthly meetings of local sections are held in addition; but there is no question that the Journal also plays a great part in the life and vigor of that Society, for the growth of the Society has been coincident with the improved character of the Journal during recent years, and no one ever hints at wishing the Journal changed into an annual volume.

The American Association for the Advancement of Science has experienced a very similar growth since its adoption of the plan by which its members receive Science regularly, without additional charge. I regret that I have not at hand the figures showing exactly the extent of this growth, but I am quite safe in saying that prior to the adoption of an official journal, which in this case supplements the Proceedings, the condition of that association was more serious than ours; while now it is very vigorous, over 1,500 new members having been added in the past eighteen months, and the total membership will in all probability reach 4,000 before the end of the calendar year.

Most of us are familiar with the Pharmaceutical Journal which has been published by the Pharmaceutical Society of Great Britain for over sixty years, beginning as a monthly but about thirty years ago being made a weekly. The publication of this journal is a part of the work of the Society, which, by the way, has a membership in round numbers of 7,000. The popular impression among us is that this journal is issued at a heavy loss by the Society, and many will no doubt be surprised to learn that such is not the case. The so-called "deficit" of \$12,000 to \$15,000 annually is merely the difference between the whole expense of conducting the journal and the income from advertisements. If the Journal account were credited with even half the amount received from members as annual dues it would show a small surplus, for the Journal has an income of \$30,000 a year from advertising. Manifestly the Journal should have credit for a proportion of the annual dues equal to its subscription price—in this case the same sum—by which means the Journal would show a surplus of about \$20,000.

To take up the other conspicuous instances would require too much time, but I shall merely ask you to recall the great journals published by the English, French and German chemical societies. Do you think it is likely that these societies would ever consent to the substitution of an annual volume of proceedings for their weekly journals?

While for the purpose of making a conservative beginning I have proposed a monthly journal, I believe that the ultimate and fullest success of the plan will be realized only by the publication of a weekly, which should be made a true representative of the best type of modern scientific journalism, conducted along liberal lines by a staff of experts under the guidance of some man of unquestioned attainments; nor should it be merely a scientific journal, for it could not thus accomplish the ends of the Association. It should give a fair share of attention to the commercial aspects of pharmacy, be practical and helpful to retail druggists, so that it will enliven their interest, first in itself and later in the work

of the Association. We must have the co-operation of the retail drug trade, which is largely apathetic at present; we should have a far larger membership, and we may have it if we will. But before we can hope to build up a permanently large membership we must learn how to hold those whom we already have—as yet an unsolved problem.

I firmly believe that an official journal will awaken new interest among our members, and it will attract the attention of the 90,000 registered pharmacists from whom our new members must come, as nothing else could do. And I furthermore believe that a truly ethical official journal of high standing would wield an excellent influence in winning the co-operation of the medical profession.

These suggestions are submitted with the hope that they will receive thoughtful consideration, and that, to quote the words of the *Pharmaceutical Review*, “the fiftieth anniversary of our Association may be made conspicuous by a modernization of the Proceedings.”

J. W. T. KNOX,

Chairman Auxiliary Committee on Membership.

THE PRESIDENT: The Chair regrets exceedingly that this report has been presented at a time when so few of our members are present. It is a report based upon very careful and extended work, and brings before us one of the most important subjects we can consider.

MR. MAYO: I move that the report be accepted and referred to a special committee, to report on at a subsequent session of the Association—or to the Council.

MR. KNOX: I think without appointing a special committee it might be referred to the Council just as well. It is a matter that must come before the Council anyway. The Council is composed of eighteen or twenty men of ripe experience, and I do not think we can find a better committee to consider it.

MR. MAYO: I prefer to press my motion, if I can get a second. This is a matter of great importance, and, however wise the Council may be, they are burdened already with a mass of detail business they must attend to, and I believe the Council themselves would prefer that the report be referred to a committee. I would not object to a reference to the Council upon the idea—or with the understanding—that the Council would refer it to a committee. I think that would be better than to refer it to the Council in the usual way.

MR. SCHLOTTERBECK: I hope the recommendation of Mr. Knox will be carried out. Although the Council has a great many details to take care of, as Mr. Mayo says, they have no more important subject than this to engage them. It is composed of some twenty members, and I think that is the place for it to be discussed, and then they can report to the Association before adjournment.

MR. SEARBY: The object which I think we should most seek to accomplish just now is a further discussion by the members. There is here but a handful; and before action is taken, and before referring to the Council—if it is referred there—I should like to see the matter discussed before a much larger meeting than this. I therefore think the motion first presented is the better one, because that will bring it up before the Association before it is considered by the Council.

MR. SHEPPARD: I like Mr. Mayo's solution of the question, that the proposed special committee report to the Council and the Council back to the Association. I say that as a member of the Council, because, as Mr. Mayo says, the detail work of the Council cannot be had to matters of this sort.

MR. HYNSON: Could not the Council refer it to a special committee of its own members?

MR. SHEPPARD: I think it had better be a committee selected from the outside. Then we would have the benefit of the ideas and advice of Mr. Knox, and of this committee of five proposed to be appointed, and then the Council. The Council would have the advantage of the work and investigation of Mr. Knox and the committee.

MR. MAYO: I think it highly essential that we should get as wide and thorough a consideration as possible in this important matter. By my suggestion, the *personnel* of the committee lies in the discretion of the President, and he can appoint only members of the Council if he thinks best. I am satisfied from experience that, in a matter of this kind, it is better to put a specific duty on a committee, rather than burden the Council. There is a large amount of detail work to get through with. In this way we will have the advice of the committee and of the Council, too. Personally, I should prefer that the special committee should not be selected from the members of the Council, because the larger the number to discuss the matter and pass on it the more apt we are to get at a correct solution of it.

MR. SHEPPARD: Speaking to the point advanced by Mr. Mayo, it seems to me this committee should not be members of the Council, and that at least two of them should be connected with the pharmaceutical press. I think we want to get as much wisdom as possible from that side. Mr. Knox is a representative of the press, and I think at least two members of the committee of five should be members of the press.

MR. HYNSON: I want to see this matter thoroughly considered, so that something will be done on this question which will not down. It has been coming up before us for several years, and ought to be settled. I remember I got into trouble at Put-in-Bay by suggesting it. It was then referred to the Committee on Publication, but that committee has never taken any action, and I want to see it put now where something will be done.

THE PRESIDENT: The motion is, to refer to a sub-committee of five.

MR. NATTANS: At what general meeting will they report?

THE PRESIDENT: That is not stated. It would necessarily come up at our last meeting, however, as we will have no general session for the transaction of business until then.

MR. NATTANS: That is too late for a general discussion. I think it is an important and practical question, and I suggest that, because of its importance, we hold a special general session for the purpose of discussing and settling the matter, if we can possibly find the time to do so.

The President stated that the motion now was, that the recommendation of the chairman of the Auxiliary Committee on Membership, as to the establishment of a drug journal, be referred to a special committee of five, to be appointed by the chair, the committee to make report to the Council for its information and the Council to report back to the Association at this meeting. And the motion was so put and carried.

The committee, as afterwards named by the President, consisted of Messrs. Caswell A. Mayo, chairman, H. P. Hynson, J. W. T. Knox, W. M. Searby and S. A. D. Sheppard.

After a discussion of some length, participated in by Messrs. Sheppard, Nattans, Hynson, Stevens, Searby, Knox, Mayo and others, directed to the point of how best to get a fuller expression of individual views upon this important question, on motion of Mr. Nattans, seconded by Mr. Sheppard,

it was ordered that when this session adjourn it be to take a recess only, and be subject to call of the chair for full discussion of this matter in an informal way, and for such further action as might be deemed desirable.

Mr. Sheppard, chairman, being called upon, then presented a partial report from the Committee on President's Address, which was as follows :

PARTIAL REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

PHILADELPHIA, *Sept.* 9, 1902.

The Committee on President's Address herewith present a partial report, requesting permission to make a final report at the last general session.

1. We believe that the system of General Prizes has not yet had time enough to show its true value or lack of value.

2. We approve the recommendation to push the sale of the National Formulary vigorously.

3. We approve the recommendation that the A. P. A. endorse the Joy Bill, H. R. 178, for reduction of the tax on alcohol to 70 cents per proof gallon.

4. We recommend that a standing committee of three on model law be appointed.

5. We heartily approve the recommendation to invite the three branches of the Government Medical Service to be represented by delegates at our annual meetings.

6. We approve the recommendation to continue the exhibits according to our present plan.

7. We think that the Council should have full authority, as at present, in regard to the question of frontispiece in the Proceedings.

8. We approve the recommendation that the 1902 Proceedings contain a complete list of the deceased members.

9. We approve the recommendation to continue the entertainments at the annual meetings.

10. We recommend that the recognition of delegates be left to the discretion of the presiding officer.

11. We approve the recommendation to send delegates to the annual convention of the N. A. R. D., and also place on record our appreciation of the good work done during the past year by President Whelpley in appointing a delegate to each State Pharmaceutical Association meeting, and advise that it be made a regular custom.

12. We recommend that the Committee on Membership, under the direction of the Council, be authorized to adopt such business methods as, in their judgment, are desirable and proper.

13. As to recommendation No. 21, bearing upon the Constitution and By-Laws, your Committee deem it good judgment to say that one of the official duties of the President, General Secretary and Treasurer is to regularly keep watch on the Constitution and By-Laws, and if any action is necessary in regard thereto, said officers may properly be considered derelict in duty if they do not call the attention of the Association to such needed action.

S. A. D. SHEPPARD.

ALBERT E. EBERT.

(For final report see minutes of the last general session.)

THE PRESIDENT: Gentlemen, you have heard this partial report of your committee on President's Address. I presume it would be proper to defer action on it until finally complete, if so desired.

MR. SEARBY: I move to adopt the report as made, and that the committee be given time for further report.

MR. SHEPPARD: There are some radical recommendations here that ought to be carefully considered.

Mr. Nattans, seconded by Mr. Hynson, moved that the recommendations of the report be taken up *seriatim* for consideration, and Mr. Sheppard stated that that was the reason the committee had made a report in part only at this time, so as to give more time for consideration, adding that the President had given a great deal of thought to the questions of which his address treated, and it was important to consider them carefully.

The motion was put and carried.

Second Vice-President Payne was called to the chair.

The Secretary read the first recommendation, advising the giving of more time for the system of general prizes to show its value or lack of value.

MR. SHEPPARD: In regard to this item I will say that the President in his address advised the discontinuance of general prizes. The committee feel that the statement they have made there covers the whole case, so far as it is necessary to speak of it—that our system has not been in operation long enough, only a short number of years, and we ought to continue it longer before we decide yes or no.

MR. MAYO: Is it necessary to act on the committee's statement?

MR. SCHLOTTERBECK: I think the recommendation of the President should receive considerable attention, but be somewhat qualified, perhaps. I do not believe in the total abandonment of these general prizes, but under the conditions they are awarded now, I think they ought to be abandoned. The President has stated the situation very clearly in his address. Any one who has had anything to do with the awarding of general prizes will appreciate the difficulties attendant upon a just award. It is next to impossible. My suggestion would be that these general prizes be abandoned, and that specific prizes be awarded instead. For example, award a specific prize in the Section on Education and Legislation, say, on an appropriate subject. I would suggest, also, a single prize, and not two or more, and that it should be made specific. General prizes are not a success.

THE SECRETARY: I might say that the committee submitting this report is not yet in possession of the report of the Committee on General Prizes, which was referred to this committee this morning; and this item might be passed until the Committee on President's Address is in possession of that report.

The Secretary then read the second recommendation, as to pushing the sale of the National Formulary.

On motion of Mr. Mayo, this item was adopted.

The third item of the report, recommending the endorsement of the Joy Bill (H. R., 178), for the reduction of the tax on alcohol was read, and Mr. Hynson moved that it be referred to the Section on Commercial Interests.

MR. MAYO: The Section on Commercial Interests could not act, except to recommend to the general Association. That would necessitate two votes on this question.

MR. HYNSON: I insist on my motion.

MR. NATTANS: What is there in this matter that we cannot act on here? Why refer it to a Section?

MR. MAYO: I move as a substitute that we adopt the recommendation as read.

MR. HYNSON: I want to say that it makes no difference to me personally, but it is a matter of commercial interest. As I look over this audience I do not see many active commercial men. Now, do we want to take the responsibility of putting this Association on record in a strictly commercial matter when those present are not commercial men? It is an important matter to them, and I doubt the advisability of acting now, under the circumstances.

The substitute offered by Mr. Mayo was then put to a vote and lost.

Mr. Hynson's motion to refer this recommendation to the Section on Commercial Interests was then put to a vote and carried.

The fourth item of the report, recommending the appointment of a standing committee of three on model law, was adopted, on motion of Mr. Beringer.

The fifth item, approving the suggestion to send invitations to the War, Navy and Treasury Departments to be officially represented at the annual meetings, was adopted, on motion of Mr. Morris.

The sixth item, recommending the continuance of the exhibits according to the present plan, was adopted, on motion of Mr. Mayo.

The seventh item, advising that the Council continue to have authority as to frontispiece in Proceedings, was also adopted upon motion of Mr. Mayo.

Mr. Morris moved the adoption of the eighth item, approving the suggestion that the Proceedings of 1902 contain a complete list of deceased members, and the motion prevailed.

The ninth item, endorsing the continuance of the entertainment features of the annual meetings, was also, on motion, adopted.

The tenth recommendation was read, advising that the recognition of delegates be left to the discretion of the presiding officer.

MR. WHELPLEY: I do not believe I made myself perfectly clear on that subject. At the present time, our delegates differ from other people, as far as privileges are concerned, in so far as, if they are not already members, they become members without being voted upon, simply by signing the Constitution and the By-laws. My idea was to officially give greater recognition to delegates from other organizations who are already members of the Association, which would necessitate some change in the Constitution and the By-laws. I don't care to particularly push the matter; still, if it were referred to the Council, it might come up at any time during the year, or at our next meeting. It will not be closed as it would be by the adoption of the recommendation of the committee.

Mr. Mayo moved that the recommendation be adopted and referred to the Council for execution, which motion was seconded by Mr. Patton and carried.

The eleventh item was read, approving of the recommendation of the President to name delegates to the fourth annual convention of the National Association of Retail Druggists, at Cleveland, September 23, 24, 25, and commending the President's course in appointing delegates to the various State associations, advising that it be made a regular custom, and was adopted by a rising vote.

Mr. Cliffe moved the adoption of the twelfth item, recommending the adoption of such business methods by the Committee on Membership, under the direction of the Council, as may be desirable and proper, which motion prevailed.

Mr. Whelpley here asked the privilege of interrupting the proceedings long enough to announce that Dr. Wiley, chief chemist of the Department of Agriculture, was in the city, and would address the members at the first session of the Section on Scientific Papers to-morrow (Wednesday) night, upon the question of the drug laboratory proposed to be established in that Department by the Government.

The thirteenth and last recommendation was read, touching the duty of the President, Secretary and Treasurer to keep watch on the Constitution and the By-laws, and to call the attention of the Association to any needed action. On motion of Mr. Morris, the recommendation was adopted.

The Secretary announced that this closed the list of recommendations made by the committee, and President Whelpley resumed the chair.

The President asked if there was any further business to be taken up at this session, and the Secretary suggested that reports from committees might be continued.

Mr. Mason moved, however, that the Association now adjourn, to take a recess until called together again by the President, according to the previous understanding.

The President said that, without notice to the contrary, this session would be called to order again at 8 o'clock to-night.

The convention then adjourned.

SECOND SESSION (CONTINUED)—TUESDAY EVENING, SEPT. 9, 1902.

The First Adjourned Session of the Second General Session was called to order by President Whelpley in Room 136, Hotel Walton, at 8:40 p. m., and was devoted solely to the informal discussion, at length, of the proposition advanced by the Auxiliary Committee on Membership in its report read at the morning session to establish a pharmaceutical journal, to be published by the Association and be its official organ, and to take the place of the Proceedings as now constituted in the publication of the proceedings of the annual meetings.

Mr. Mayo, chairman of the special committee of five appointed by the

President under authority of the resolution passed at this morning's session, first stated that his committee had no report to make at this time, as they considered it wiser to come with open minds and get the views of as many members of the Association as possible before making up their report and submitting it to the Council. At request of the chair, Mr. Knox, chairman of the Auxiliary Committee on Membership, then made a statement of the reasons which had led his committee to suggest the plan now under consideration, discussed the prospects of success of such a journal, and quoted facts and figures from the history of similar publications by other societies, domestic and foreign. Then followed a long and informal discussion between, and statement of individual views by, the members present, which was participated in by Messrs. Hynson, Searby, Sheppard, Caspari, Puckner, Knox, Hechler, Alpers, Jones (of South Dakota), Schlotterbeck, Hancock, Payne, Gibbard, Kremers, Lyons, Stevens, Helfman, Prescott, Frost, Claus, Hassebrock, Hays, Fisk and others.

On motion of Mr. Fisk, the Association again took a recess, subject to the call of the President.

SECOND SESSION (CONTINUED)—WEDNESDAY EVENING, SEPTEMBER 10, 1902.

The second adjourned session of the second general session was held in Horticultural Hall, Broad street, and was called to order at 8 p. m. by President Whelpley, just before the meeting of the Section on Scientific Papers in its first session at the same time and place.

THE PRESIDENT: I will call to order the general Association, which took a recess at our last meeting. We come together for the purpose of receiving the report of the Committee on United States Pharmacopœia. It has been the custom in past years to refer this report to the Section on Scientific Papers. The report is now before you, gentlemen. What action will you take upon it?

MR. CASPARI: I move that we again refer this report to the Section on Scientific Papers.

Mr. England seconded the motion, and it carried.

THE PRESIDENT: If there is no further business before the Association, a motion to take a recess, to re-assemble at the call of the President, will be in order.

Mr. Kremers moved accordingly, and the Association in second general session again took a recess.

THIRD SESSION—TUESDAY AFTERNOON, SEPTEMBER 9, 1902.

No business was transacted by the Association previous to the session of the Section on Commercial Interests.

FOURTH SESSION—WEDNESDAY MORNING, SEPTEMBER 10, 1902.

This session was devoted to the discussion of exhibits.

The session was called to order at 10:35 a. m. by President Whelpley in the convention hall of the Hotel Walton.

The Secretary announced that before proceeding with the regular order, he desired to give notice of a proposed amendment to the By-Laws, chapter viii, articles vi and vii, the object being to equalize the number of sessions allowed the three Sections on Practical Pharmacy and Dispensing, Scientific Papers and Legislation and Education, providing two sessions for each. He then read the following:

Moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that chapter viii of the By-Laws be amended as follows:

Amend Art. vi by striking out the word "session" and insert in place thereof the words "and fifth sessions."

Amend Art. vii by striking out the word "fifth."

The chair said the members would please take notice of the proposed change.

THE PRESIDENT: Now that the preliminaries are over, I want to state that this session belongs to our friends, the commercial men, who have been at great pains to prepare novel and attractive exhibits for our benefit. As we learn from Jean Ingelow—

"What it shows and what it teaches
Are not things wherewith to part."

The commercial man is an important factor in everything connected with pharmacy. In fact, his life is devoted to the pleasure, comfort and welfare of others. It was a little girl who, when asked what her father did, said: "I have no papa; he is a commercial man." [Laughter.] She didn't see enough of him at home to know she had a father. He was looking after the comfort, welfare and prosperity of others. This session is devoted to that class of people, interested in pharmacy. Now, each firm called will be entitled to five minutes time—and the Secretary will keep the time. [Laughter.] The first firm is the William S. Merrell Chemical Company, of Cincinnati, represented by Mr. E. H. Cone.

MR. CONE: Nearly fifty years ago Dr. Wm. S. Merrell presented a paper to the American Pharmaceutical Association on "The Solubility of All Medicinal Substances in Alcohol." At this time the manufacture of fluid extracts was in a very unsatisfactory condition, and pharmacists generally were just beginning to learn that a decoction of a drug preserved in syrup was not the best form of fluid medicine. When Dr. Merrell expounded the doctrine that has ever since been the guide for the manufacture of tinctures, both by himself and his successors, he expressed himself as follows:

"Alcohol in its solvent power accurately discriminates between the medicinal and non-medicinal principles in plants; the former being the poisonous, the latter the non-poisonous or nutritive element."

While this principle with reference to the menstruum was being expounded, proper care in the selection and preparation of the drug itself was not overlooked. It was found that in many instances the medicinal virtues of the drugs reside in certain volatile principles which were driven off by the ordinary drying process, or in other cases in oleo-resins, which became oxidized by the ordinary methods of handling, and through

other changes became insoluble in ordinary menstrua. In many cases the medicinal principles of the plant originally soluble in the natural juice and also in the usual solvents, become insoluble in these same solvents when stored before use. As examples of these various drugs in which the changes outlined are liable to occur, we have exhibited a fluid extract of black haw in which you will notice particularly the characteristic odor of valerianic acid in its natural condition, so different from the ordinary fluid extract prepared from the dry drug and with a more aqueous menstruum.

This is also very noticeable in the fluid extract of gelsemium and black cohosh. Our corn silk is almost too well known to require any comment at this time. While it is only a physical characteristic, it will be noticed that this light color indicates the entire absence of decomposition of the corn silk, from which it is manufactured.

Cotton root bark and stillingia are noticeable examples in which the active principle becomes insoluble with age, and this is to some extent true of the fluid extract itself made with a hydro-alcoholic menstruum. The active principles of these drugs, when fresh, are very soluble in alcohol, and when dissolved in this condition, remain in solution almost indefinitely. Experience has shown, however, that upon drying, the active constituents of these drugs become almost insoluble in any solvent, and the so-called fluid extract made from the dry drug is practically inert. It is to this fact that we attribute the condemnation of cotton root bark as a therapeutic agent, in that the fluid extract of the green drug was unknown.

We also show a few examples of our Soluble Perles, which for variety of ingredients and perfection of workmanship are we think worthy of your examination.

To those who were at the meeting last year, the rest of our exhibit will be somewhat of a repetition, including as it does various preparations from natural oil of wintergreen and a few resinoids—the white alkaloid of hydrastis, with which the Merrell Company has been identified for many years. It may not be out of place to say at this time that the use of natural salicylates is constantly growing and our own output is increasing.

We show a line of salts from the natural oil, from an oil which is not adulterated, and invite your examination.

In addition to our regular display products, we have a small exhibit illustrating a paper which will be read before the Scientific Section, on Podophyllin. In the effort to establish a reliable standard for this important article, we have been led to investigations which are reported in the paper referred to, and which show the necessity we think of modifications in the test to be applied to the podophyllin in the new Pharmacopœia.

We will not take up any more of your time, but refer you to the paper, and to the exhibit in Horticultural Hall.

The Appert Glass Company was next given the opportunity to present its claims, and was represented by Mr. S. T. Crissy, who spoke of the practically unbreakable character of their glass vessels, which they were able to produce from a plastic mass of chemically inert glass. He said they made vessels of as much as forty gallons' capacity, of great mechanical strength, and which could be drilled for faucet-holes of small or large diameter. He exhibited specimens of his company's wares, including a stand on rollers for holding their glass vessels and containers, which they made in a variety of metals. He also exhibited and explained the working of what he claimed to be a perfectly air-tight cover or "closer" for his glass vessels and tanks, which was also leak-proof and evaporation-proof. An inspection of the company's exhibit was invited.

Fairchild Bros. & Foster was represented by Mr. G. L. Metze, who

invited an inspection of the latest development in ferment work, as exhibited by his firm in Horticultural Hall. He promised that no one should be "peptonized" who came.

The American Peroxide & Chemical Company was represented by Mr. Harry D. Folsom, who contented himself with extending an invitation to the members to visit his company's exhibit in the hall across the way—particularly their hydrogen peroxide.

Smith, Kline & French Company had as their representative Mr. Albert Hart, who confined his remarks to the subject of sponges, explaining the difference between pure and loaded sponges, the advantage of buying the former, and told of the various methods of loading. He invited an inspection of his company's exhibit, and said they had an expert there who would give a demonstration of a loaded sponge.

Merck & Company were represented by Mr. R. B. Gable, who called attention to the nineteen-pound jar of cocaine hydrochloride in the company's exhibit, inviting the gentlemen present to go over and help themselves; also to a vial of hyoscine hydrobromide worth \$10,500, and one of homatropine worth \$3,750. He directed particular attention to a tray of coca leaves, six pounds in weight, or 42,000 grains, with a small vial in front of it containing the cocaine alkaloid derived from these leaves, containing 210 grains—42,000 grains of coca leaves, 210 grains of alkaloid. An inspection of the exhibit was asked.

The chair said the next exhibit spoken to would be the American Pharmaceutical Association Historical Exhibit, prepared by Mr. Geo. M. Beringer and his associates on the Committee on Semi-Centennial Celebration, and that Mr. Beringer would present it.

Mr. Beringer prefaced his remarks by stating that his Association with these old relics made him feel old himself. He said the exhibit formed the most heterogeneous collection ever exhibited to the American Pharmaceutical Association—a collection that Mr. Joseph P. Remington had declared to be "A most priceless collection of the most worthless stuff." None of the "stuff" was for sale, however. Some of the articles appealed to the pathetic side of pharmacy, others to the ludicrous. He called attention to two unique bottles that had come to him, one from Mr. Remington and one from Mr. Hynson; also to a variety of old mortars and pestles of brass, bronze, wedgewood, wood, marble, etc., some of them used by the ancient Egyptians, others by the Arabians and Venetians. Mr. Beringer spoke of the exhibit of some old journals of Dr. Squibb, one of which he saved from fire at the peril of his life; of his balances, upon which he did the exact work necessary for the making of his alcohol tables, and which he had used for the determination of specific gravities. He called attention to the portraits of such men as William Procter, Jr., Dr. Edward R. Squibb and John M. Maisch, and some before them, and to certain relics of their work—one, the last preparation made by Mr. Proc-

ter, only four hours before his death. He spoke of the numerous books, certificates, diplomas and relics of various kinds on display, and invited a careful study of the exhibit, promising that the members would find much to interest and instruct them there.

The President stated that this would be an appropriate time for Mr. John Uri Lloyd to read a paper he had prepared on the mortars and pestles of the ancient cliff-dwellers, and Mr. Lloyd read the following paper, exhibiting before his audience a number of specimens of lava and granite mortars, and pestles of varying size and shape taken from the homes of this pre-historic people in Arizona—some of them used for grinding food, apparently, and others for preparing medicines. His presentation of his subject was very interesting, and he was heartily applauded when he had finished.

PREHISTORIC PHARMACY IN AMERICA.

BY JOHN URI LLOYD.

The poet Longfellow is reputed to have been visited by an English traveler, who said : "Your country, sir, is so awfully big and new, one cannot see it in an age. Then, sir, there are no castles, no ruins, to tell of old times."

Whether this story is fact or not, the expression voices the views of the majority of Europeans, and, I fear, Americans as well. As one reared from childhood among prehistoric mounds, and man-made relics that speak of an American antiquity that is voiceless in its backward touches, I cannot but resent such groundless words. As one whose after-life was passed in connection with explorations and excavations among these mounds and relics of primitive man, from which comes no record concerning their creators, I cannot but offer a feeble protest. In boyhood days I wandered amid the burial places of a long-lost people. From the freshly-washed gravel banks, deep in Kentucky soil, I collected shell-made pottery and utensils, such as Indian tradition knew nothing about. And as I look back and ponder over such unappreciated antiquarian riches once at my command, but now lost forever, I wonder how any thoughtful man can consider America as a country just opened up to man.

Grant to the so-called Old World all its marvelous antiquarian riches in stone and bronze, gold and precious gems, and yet we have American monuments as a heritage of the past that possess a charm as touchingly pathetic as are the tracings of dead civilizations in other lands.

To pharmacists in particular is this study of these ancient remains significant ; for we find typified therein the fact that nations who lived, and died, and left no cry, or word, or page of print to tell their story, were master workmen with the mortar and pestle.

But to study these relics we must pass from well-known Eastern American antiquities, such as the Mound-Builders left in profusion in all this

great Central West. We must pass the shell monuments of Florida and the connected chains of mounds that stretch from the mouth of the Mississippi to near the Dominion of Canada. This great region, as far eastward as the Atlantic shore, is thickly dotted with the remains of a form of civilization that gives no other record of itself than upbuilt mounds of mud and heaps of shell, such as very primitive people use for self-existence.

Turn from this forgotten people to the great Southwest, that land so recently carved out of the so-called wilderness, which in our boyhood was defined as a part of the Great American Desert. A marvelous scene presents itself. Behold! this is not a new land. New to modern man it may be, but nevertheless a country literally dotted with villages and houses, a land rich in habitations of forgotten races. "Unexplored territory" has this been called but recently, this country that carries in itself lingering evidences of man's antiquated handiwork sufficient in themselves to astound one who stands amid its ruins. Silent villages and abodes by the thousands are here, carved avenues in solid rock, stone-built houses standing as if deserted but recently. And yet back again are hillocks, that, built in dimmer distances, show where in preceding ages buildings have crumbled into dust in this arid atmosphere where flesh dries and decay is unknown.

A section of this land as large as a mighty European empire was once covered with lava. Through it peep the ruins of stone houses, whose builders left no cry to tell of that seismic convulsion. Man dare not conjecture its location in the centuries lost to time. Here in this New World's oldness are dwellings that astound us even to-day, a single stone-built house covering five acres, with fragments of its walls yet standing five stories high, over two hundred rooms on the ground floor.* Here are chains of dwellings cut into solid stone cliffs and perpendicular canyon sides practically inaccessible now to man. And in the desert afar stand deserted villages, where to-day the explorer must carry water to drink and needs be careful, too, that his supply does not give out. In those sun-burned houses of the desert once teeming with life, no drop of water is to be found. Thousands of abodes and villages in cliff and desert and valley from Utah and Colorado in the north, reach down into Mexico and Central America, where abound deserted pyramids and ruins of great temples. Silent are one and all. Their human records are as hoary puzzles as is the Ohio Mound, that stands on the height near where these lines are written.

Of the ruins of the *Old* World we hear much. Much that is tangible history have their people left to tell their story. But the ruins of this so-called New World, from Atlantic to Pacific, from Alaska to South America, rest in absolute pre-historic darkness. No written word, no

* Records of the Past.

voice, no tradition, no legend, no mythological line in stone or papyrus stands to say aught concerning the lives that came and went in those great tragedies played in time lost to man.

From out this fascinating Southwest land, covered with its relics of pottery, baskets, stone implements, and such, come down to us pharmacists, the link that binds us professionally to those silenced nations. A profusion of stone mortars and pestles, granite, lava and sandstone, litter their deserted habitations. Some of these mortars are of prodigious size, and show the effects of what seem to be ages of pestle toil. These were food-grinders, and their owners must have been expert knights of the pestle beyond compare. Other mortars, as, for example, these exhibited herewith, are very small, and needs must have been used for concocting arrow poisons and medicines. Grading up from little ones such as these before us, the mortars of the cliff-builder grow to a dished cavity in the adjacent mountain of lava.

The pestles are a study in themselves, varying as they do in size and shape in accordance with the dish of the mortar bowl, and the use to be made of the utensil. These, as shown by the specimens herewith presented, some of them made of hardest lava and yet much worn by use, exhibit peculiarities that puzzle one who studies them with thoughtful care. Accept that the people who made and used them were masters of the utensils that give us our professional emblem, and we do them justice only. Indeed, we must award them an exalted position in our art, for they teach us lessons concerning the pestle's form, which with us is one common pattern, but with them varied both as to texture and model.

But I must not take your time by details that space will not permit. Possibly if the subject is important enough to others, I may sometime present the study of this subject in which I am now involved with the utmost charm to myself.

Be it enough to-day to bring these specimens of mortars and pestles, and say this, our semi-centennial, is but a leaf in time's great volume, if it be contrasted with the vanished centennials of our American brethren, whose mortars and pestles are before us. All that is left to speak of their celebrations and jubilee gatherings is locked in such conjecture as comes from out the painted desert, the dazzling carved canyon cliffs, and homes smothered in dust and lava. The stone record of their acts is before us, yet the book of their lives must needs be forever closed.

The President said he had been asked by Mr. Beringer to call attention to two unique shelf bottles—two of a large set—that were in use by a physician in Belleville, Illinois, for many years, the labels upon which had baffled translation. He exhibited them to the audience, and invited an examination and effort to make the translation.

Mallinckrodt & Co. were now given a hearing through Mr. L. G. Blakes-

lee, who exhibited a specimen of tannin made by his company, which he claimed to be the only manufacture of that substance in the United States answering the requirements of the U. S. P.—absolutely pure, and made from the finest quality of nut-gall, and up to the standard of the best imported goods. He said that the ordinary grades of tannin would not be recognized in Germany for pharmaceutical purposes. He said his company also supplied the same grade of tannin in powdered form for convenience in dispensing. He spoke of the fact that for many years this country had depended entirely for its supply of hypophosphites upon its imports from Europe, but said they were now made here of a high quality, and spoke of his firm's large output. He directed attention to a large cake of morphine in his exhibit, crystallized in one solid block and weighing 1557 ounces, which, with his company's other products, including their phosphoric acid of great purity, he invited an inspection of.

Sharp & Dohme were represented in the person of Mr. C. E. Vanderkleed, who said their exhibit was one primarily of drug standardization, which had not heretofore kept pace with the progress made along manufacturing lines, but in which wonderful progress had been made recently, and that they were now assaying drugs that contained not only alkaloids as the active principle, but volatile oils, resins, glucosides, and many other substances. He directed attention to the representative line of crude drugs they exhibited, selected from among the many they assayed, beginning with the fluid and powdered extracts there shown, and said they displayed in a separate case the active principles of these drugs in the form they were obtained from the assay. Some of these drugs were very valuable, he said, in fact, worth their weight in "anthracite coal," a measure of value that appealed with particular force to the members present from the East, where the coal problem is now such a serious one. Mr. Vanderkleed said they were making the actual chemical assays of these drugs—in the fluid extract to save time—there before the exhibit, and invited the members to witness the process, bearing in mind that they naturally could not employ all the facilities there which would be found in a well-equipped laboratory. He spoke especially of the assays of ergot, cascara sagrada, rhubarb and senna, and praised the great work of Prof. Tschirch in determining that the cathartic action of the two last-named drugs is due to oxymethylantraquinones, yielded by the glucosides present in these drugs. He extended a cordial invitation to visit the exhibit.

The Secretary here called the attention of the members present to a large photograph of those present at the meeting of the American Pharmaceutical Association at Cleveland in 1872, which had been sent by Mrs. Maisch for inspection, as she thought it might be an object of interest, especially to those present at this meeting who had attended that meeting thirty years ago.

The Horlick Food Company's spokesman was Mr. D. Wadsworth, Jr.,

who briefly referred to the well-known preparation, Horlick's Malted Milk, and said that since the last meeting his company has added to its list a combination of malted milk and chocolate, made in tablet form, which was especially palatable. He invited the attention of those having a cold soda water apparatus to the proper manner of preparing and serving malted milk ice-cold, as demonstrated at their exhibit across the street, which all were asked to view.

McKesson & Robbins had Mr. W. J. Evans for their representative, who spoke of the alarm of the world over what had come to be recognized as diseases of dust, and of experiments made demonstrating the fact, and exhibited and explained a little device contrived by himself, in the nature of a nose-bath, which he claimed would go far in its use to avoid the evil consequences of breathing contaminated air by promoting cleanliness of habit and inducing natural secretion of the mucous membrane. The device was in the shape of a little glass cup, of special form suited to its particular use.

Schieffelin & Co. were represented by Mr. William J. Schieffelin, who mentioned their exhibit of historical documents dating from 1794 and taking in the first half of the last century, and exhibited some crystals of cocaine alkaloid just made at their laboratory, which he claimed to be the largest that had ever been made; these, he said, were of great value, and would be presented to the Philadelphia College of Pharmacy. These large crystals, Mr. Schieffelin said, could only be obtained by working with solutions very large in quantity, pure in quality, and very slow in cooling. He asked an inspection of their exhibit in Horticultural Hall, and offered, with the best compliments of his firm, a copy of their handbook, published about eight years ago, to each member who had not already received one.

H. K. Wampole & Co. had as their spokesman Mr. Raymond L. High, who said his firm had come into the field of pharmaceutical manufacture quite recently, but that since they had started to manufacture the galenical preparations their standard had been the highest; that such drugs as hyoscyamus, belladonna, etc., which would come of a high standard at one time and lower at another, were always assayed before being allowed to enter their preparations, and that, though they always endeavored to get belladonna and other drugs of the highest standard, if they could not obtain the proper alkaloidal strength from one pound of the drug, say, they would increase the quantity until the proper strength was obtained. He said all their chemicals were first assayed before being permitted to go into their preparations, and after they were made into galenicals the finished product was also assayed. He invited an inspection of their exhibit.

The Maignen Filter Co. was represented by Mr. P. A. Maignen. Mr. Maignen advocated the use, always, of filtered water by the pharmacist in the preparation of drugs, so as to eliminate the elements of iron and lead

from pipes often found in water, as well as the impurities of sewage and from natural causes, thus not only elevating the standard of his work, but sometimes saving himself from censure. He extolled the merits of his system of filtration, and made some interesting experiments in the elimination of lead and iron held in acid solution. He said the filtration was purely by physical action, not chemical, and that the heavier particles of the metal were stopped and retained by the fine screen of the filter, while the water particles passed through.

The Mellin's Food Company was represented by Mr. J. J. Jones. Mr. Jones said it was like "carrying coals to Newcastle" to talk Mellin's Food to this audience, and he would content himself with inviting the members to visit their exhibit over the way. He mentioned the fact that Mr. Doliber, president of his company, had been a member of the Association since 1859, forty-three years, and that his certificate of membership, to be seen at the exhibit, was signed by some men prominent in its history—Parrish, Maisch and others—whose signatures it might interest some to examine.

The Ideal Cash Register Company was next given an opportunity to be heard, through Mr. James McEwan, who spoke in general terms of the merits of his machine and invited an inspection of the latest patterns on exhibition over in the hall, where they would be delighted to explain the mechanism in detail and show its adaptability to the drug trade. He said that still further improvements were in process of being perfected.

Mr. H. K. Mulford here asked to be permitted to interrupt long enough to announce that he hoped as many as possible of the members would visit the vaccine and antitoxin plant of his firm at Glenolden, a few miles out of the city, Thursday morning, for which a special train had been provided.

The Ottinger Exhibit had Mr. Wm. H. Short for its spokesman, and that gentleman paid a handsome compliment to Chairman Cook, of the committee, for his untiring efforts to make the exhibition pleasant and profitable to all, and then said he would permit the graphophone to tell the assembly of the merits of the specimen of hypophosphites, compound zhongiva and sodium phosphate exhibited by his company, and this was done.

The Waterman Ideal Fountain Pen exhibit had attention called to it very briefly by Mr. W. J. Chaplin.

There being no further business before the session, on motion of Mr. Caspari, the Association then adjourned, to meet in Special Jubilee Session, Thursday afternoon, at 3 o'clock.

FIFTH SESSION—WEDNESDAY EVENING, SEPT. 10, 1902.

No business was transacted previous to the first session of the Section on Scientific Papers.

SIXTH SESSION—THURSDAY MORNING, SEPT. 11, 1902.

No business was transacted previous to the second session of the Section on Scientific Papers.

SEVENTH SESSION—THURSDAY AFTERNOON, SEPT. 11, 1902.

The Golden Jubilee Meeting of the Association.

The Golden Jubilee Session of the Association was held in the Museum Hall of the Philadelphia College of Pharmacy, on N. 10th street, and the hall was completely filled with ladies and gentlemen gathered to do honor to the occasion.

President Whelpley called the assembly to order at 2:50 p. m., and said :

Members of the Association, Ladies and Gentlemen: Colleges of Pharmacy have played an important part in the history of the American Pharmaceutical Association. The Convention of 1851 was called by the New York College of Pharmacy, and the meeting held within its walls. The following Convention of 1852 was held in the Philadelphia College of Pharmacy, and organized this Association. It is pleasant now to meet within the walls of the same institution to celebrate by special exercises our Golden Jubilee. But I regret to have to announce that the unexpected has happened, and we are deprived of the presence of our Honorary President, Doctor Frederick Hoffmann, of Berlin, who came over to this country from Germany in order to be with us here to-day, but, owing to sudden illness, was obliged to return home last week. Thus we are deprived of his presence on this occasion, and are the losers thereby. I have been selected as the moderator of the proceedings on this very important occasion, and I thank you very much for the honor and the confidence thus manifested. The address which Dr. Hoffmann had so carefully prepared has been placed in the hands of our General Secretary, and an abstract of the historic document made for the purpose of presentation at this meeting. Our General Secretary, Mr. Charles Caspari, Jr., will first convey to you the personal message which Dr. Hoffmann gave him to be conveyed to you on this occasion, and will then follow with a reading of the abstract, which Dr. Hoffmann had intended to present himself had not the unforeseen occurred.

Mr. Caspari said :

Mr. President, Ladies and Gentlemen: I am sure we all share alike in the great disappointment that we suffer by the absence of our friend, Dr. Hoffmann, who, in bidding me farewell at the railroad station in Baltimore a few days ago, charged me to convey his kindest greetings to all, and particularly to express to this assembly his deep regret and sense of disappointment at his inability to be here to-day to join with us in commemorating the fiftieth anniversary of the American Pharmaceutical Association. Dr. Hoffmann was visibly affected by the turn of affairs. He had come to this country and traveled many miles for the purpose not only of joining in these exercises, but of greeting many old and dear friends; and when he learned from his medical advisers in Baltimore that it was necessary for him to return quickly to Europe, owing to a heart affection from which he suffers, he was deeply grieved, and tears came into his eyes when we parted. Dr. Hoffmann took an intense interest in this commemoration, and I might say at a personal sacrifice had crossed the ocean to be with us. He first visited some of the health resorts of Europe for the purpose of recuperating for this occasion, and, having

consulted eminent medical authority abroad, thought there would be no danger in making the trip to this country. But, unfortunately, he became worse here, and his physicians here, fearing something more serious, ordered him back to Europe.

Permit me, Mr. President, to thank you for the honor of having been called upon to read the abstract which Dr. Hoffmann himself had prepared of the address written for this occasion. I will endeavor to do justice to it as best I can.

The following is the full text of the address :

A RETROSPECT OF THE DEVELOPMENT OF AMERICAN PHARMACY AND
THE AMERICAN PHARMACEUTICAL ASSOCIATION.

BY FREDERICK HOFFMANN.

In opening this jubilee session I beg to thank the Association for having invited me to be here on this memorable occasion. Whatever the reason of your choice may have been, I assure you that I highly appreciate your friendly remembrance and consideration. Although in declining years and not of late enjoying the best of health, I have nevertheless considered it a duty to accept your kind invitation, and have crossed the Atlantic rather than disappoint many dear friends here assembled, as well as to greet the large and able array of younger men and friends who have risen to honorable position and distinction in American pharmacy.

In this hour of recollection and gratitude we should feel inspired by the memories and traditions of the historic events which have taken place in this, the first metropolis of the rising transatlantic nation, and we should be mindful of the eminent, patriotic men and women who have so nobly done their share in raising and upholding the foundations of this great and blessed country in times past. We should furthermore bear in grateful remembrance, the lives, the labors and the accomplishments of those who, inspired by lofty aims, have wisely built and promoted the correlated arts of American medicine and pharmacy, and who half a century ago assisted in the organization of this Association. These Nestors of American pharmacy have all passed away, but the remaining veterans who have mingled with them in friendly communion at the earlier annual conventions keep their memory sacred :

“ On fame's eternal camping ground
Their silent tents are spread,
And glory guards with solemn round
The bivouac of the dead.”

In turning our thoughts backward over the records of a glorious past we cannot but trace the footprints and the milestones marking the growth and the development of American pharmacy as one of the many links in the material and intellectual organization and final culmination of the great American Commonwealth, risen to mighty proportions in the course of less than two centuries.

Under this impulse I have ventured with but very scanty historic resources at my command to present on this occasion a brief sketch of the rise and the growth of American pharmacy and of its representative Association.

THE PRACTICE OF MEDICINE IN COLONIAL TIMES.

The primitive practice of the healing art on the North American continent by the "medicine men" and matrons of the Indians* was supplemented, in the course of the 17th and 18th centuries by the hardly less empirical methods and usages of the early European settlers. These, sailing in British and Dutch vessels, as is well known, came mainly from England, Holland, Germany and Scandinavian countries. In the treatment of bodily ills the "comforters of the sick," as medical advisers and dispensers were then called, followed the practices and customs of their home countries and used their domestic remedies as best they could in their new environments. A few men skilled in the medical art of the day may have accompanied or have followed these early settlers. Their methods and practices, however, differed mainly in standing on a somewhat lower level and being more empirical and loose than at home, where the practice of medicine and pharmacy had been divorced by custom and legal enactment, except perhaps in England, where both professions remained much longer vested in one class of practitioners.

The medical service in the colonies was largely in the hands of matrons and wiseacres, whose practical information and experience came from domestic association with the sick and from tradition, while the more serious cases were treated by the clergy, with whom, as among the primitive peoples of all ages, the higher learning rested. Many of the early ministers of those colonial times occupied themselves with the study and practice not only of theology, but also of the healing art, attending to both the spiritual and bodily welfare of the people, or, as it was called, to the "angelical conjunction of the cure of the soul and the body." Not a few of these men, who perhaps were more devoted to the relief of the bodily ailments and more successful as medical than as spiritual "comforters," had acquired by study, common-sense, observation and experience, to their own and their neighbors' satisfaction, a fair working knowledge of the healing art and of the preparation and use of domestic medicines, while some of these autodidacts gained quite a reputation for their medical and surgical skill, and ranked in the colonies among the foremost practitioners and teachers of medicine of their day.†

* Described by Dr. Benjamin Rush in an address, "An Inquiry into the Natural History of Medicine among the Indians of North America," delivered before the "American Philosophical Society" in Philadelphia, February 4th, 1774, and published in the Transactions of the Society for the year 1774.

† Among the earliest of these eminent clerical practitioners is recorded Samuel Fuller,

These conditions prevailed in general during the 17th and the first half of the 18th century, when the healing art in the new country embraced both the application of therapeutical and surgical knowledge and skill and the preparation and supply of medicine. The practice of medicine as a distinct art received but little consideration from the colonial authorities, and was left without restriction, encouragement or recognition. The advantages offered in the new trans-Atlantic settlements were not sufficiently attractive to fairly educated European physicians and pharmacists to induce them to emigrate thither in any considerable numbers. These new fields rather used to draw less educated and adventurous persons who were shrewd enough to accommodate themselves and their practices to the prevailing conditions of the new country and its heterogeneous crowd of settlers. In those days any one who knew jalap from ipecac, and calomel from tartar emetic, and had the assurance to use them at his option, to make and apply ointments and plasters, to dress wounds, to splint a broken limb, was a welcome settler, and received without asking the title of doctor.

EARLY MEDICAL EDUCATION.

When in the course of time, and with the increasing immigration of a class of better schooled practitioners of medicine, the healing art became more and more a distinct profession, young men entered the art by indenturing themselves as apprentices to medical and surgical practitioners. They used to "serve their term," as it was called, generally from

one of the passengers of the "Mayflower" in 1620. He settled in Plymouth, Mass., and became one of the most reputed medical practitioners in "all the colonies around Massachusetts Bay." He died in 1633. His wife enjoyed an equally wide reputation as midwife. (Russel's Recollections of the Pilgrims, p. 246.)

Another passenger of the "Mayflower," and later on a deacon of the Boston church, was an English apothecary, Giles Firmin, who became also famous as a medical practitioner. As early as 1647 he delivered readings on human osteology, and is said to have had the first "anatomical cabinet in the country, which he did make and read upon very well." He returned to England in 1654, was ordained a minister, and died in 1697, aged eighty years. (New England Historical and Genealogical Register, Vol. IV, p. 11.)

Dr. Charles Chauncey (born 1589, died 1677) and Dr. Leonard Hoar (born 1630, died 1675), both theologians and presidents of Harvard University, enjoyed a wide reputation as skilled medical practitioners. (Packard, History of Medicine in the United States, 1901, pp. 16-18 and 34.)

Dr. Jonathan Dickinson, the first President of the College of New Jersey (now Princeton University), was the first pastor of the Presbyterian church of Elizabeth, N. J., and eminent as a practicing and dispensing medical practitioner. He died in 1748, aged 59 years.

Dr. Thomas Thacher was distinguished in medicine as well as in theology, and was minister in Weymouth, Mass., and after 1644 in Boston. He published in 1677 the first contribution to popular medical literature under the title, "A Brief Rule to Guide the Common People of New England how to Order Themselves in the Small-pox and Measles." (Toner, Contributions to the Annals of Medical Progress and Medical Education in the United States. 1874, pp. 9 and 19.)

three to six years. This period of time, before being permitted to assist in medical and surgical practice, was devoted to the books on the shelf, the skeleton in the closet, the extract kettle on the hearth, the mortar and pestle and the pill-tile in the back room. To pulverize barks and roots, to make and spread plasters, to prepare ointments, tinctures, extracts, blue mass, etc., were the arduous duties of the day. In summer time they also roamed through the woods and fields to gather herbs, roots and barks for replenishing their master's stock of domestic drugs.* Advanced students were instructed in bleeding, cupping, extracting teeth and dressing minor wounds, and had to attend to the night calls in the office. They also were entrusted with the compounding of prescriptions, and permitted to accompany their preceptors when visiting patients. Some specially skilled and reputed practitioners frequently had several apprentices at one time who constituted a small class, being drilled for the first years mainly in the pharmaceutical practice of the medical art of the day. Upon the expiration of this apprenticeship, the young men, provided with a certificate of proficiency from their preceptor, but without any diploma, were for further experience and proficiency thrown upon their own resources and chances. The more able ones entered upon the practice of medicine with varying degrees of attainments and skill. Those with higher aspirations and sufficient means used to cross the Atlantic for further study and for the purpose of obtaining a diploma, resorting for the most part to the medical schools of the universities of Edinburgh, London or Leyden,† but a considerable number ventured, by chance or from necessity, into other remunerative pursuits, mostly into the drug and general merchandise line.

In this way, as in the primitive evolution of the medical art in all countries and at all times, the practice of medicine and pharmacy remained for more than a century vested in one profession, and in the course of time and the tardy development of the professions and arts pharmacy largely emanated and received its first and by no means unsuitable recruits from the rank and file of such medical aspirants more or less schooled in the elements of the pharmaceutical art. This evolution has ultimately led to a stricter differentiation and gradual separation of the practice of medicine and of pharmacy as distinct but co-ordinate professions. It is not unlikely

* Some of the early medical settlers were specially skilled in the art of pharmacy, as well as in botanical knowledge and interest. Noted among them was Dr. John Mitchell, who came from England to Virginia about the year 1700. He settled in Urbana on the Rappahannock River, became eminent as a medical practitioner and botanist, publishing about the year 1750 a work on the botany of Virginia, besides numerous contributions to the Royal Society at London. (Toner, Contributions to the Annals of Medical Progress. 1874, p. 9.)

† In the list of graduates in medicine in the University of Edinburgh, between the years 1758 and 1788, the names of sixty-three Americans are inscribed. (Packard's History of Medicine in the United States, 1901, p. 156.)

that from such an initial stock of medico-trained druggists, and from the comparatively small number of immigrated European apothecaries,* the first series of a more proficient class of American pharmacists emanated.

EARLY ENACTMENTS RELATING TO MEDICAL PRACTICE.

During the long British rule in the colonies along the Atlantic coast quite a number of statutes were enacted for the regulation of sanitary and medical matters, the earliest ones for Virginia in the years 1636,† 1639,‡ 1645, 1657 and 1662; Massachusetts following in 1649;§ New York in 1652 and 1665;|| the Carolinas in 1706, 1712, 1721, 1738, etc.;¶ Connecticut in 1715 and 1752.** Most of these enactments concern mainly the charges of medical practitioners for prevailing infectious diseases, such as small-pox, measles, yellow fever, etc., and some restrictions in regard to the practice of surgeons, midwives and apothecaries. It appears, however, that these statutes mostly remained dead letters and soon fell into oblivion.

ACCESSION OF BETTER EDUCATED PRACTITIONERS.

The French and Indian War of 1754 and the following years, concluded by the Peace of Paris in 1763, and resulting in the conquest of Canada by Great Britain, gave perhaps the first efficient impetus to an improvement

* Among the first comparatively few educated medical men arriving in the colonies were those of the Dutch West India Company, established in the year 1621, by which New Amsterdam (since 1664 New York) was held. Among those who attained eminence in the colonies prior to the British assumption of government in 1664 are mentioned as prominent "comforters of the sick" several Dutch apothecaries, prominent among them Dr. Jacob Belkamp and William Beltsnyder, both in New Amsterdam, in the first half of the 17th century. (Documentary History of New York, Vol. I, p. 77, and Vol. II, pp. 182 to 191.)

† The first enactment passed by the colony of Virginia, August, 1636, was entitled: "An Act for regulating the fees and accounts of practitioners of physic." The arguments for its passage are described in "Hening's Statutes of Virginia," Vol. IV, 509 to 510, as follows: "The practice of physic in this colony is most commonly taken up and followed by surgeons, apothecaries, or such as have only served apprenticeship to those trades, who often prove unskillful in the art of a physician, and yet do demand excessive fees and exact unreasonable prices for their medicines which they administer, and, for the sake of making up long and expensive bills, too often load their patients with greater quantities thereof than are necessary or useful, concealing all their compositions, as well as to prevent the discovery of their practices as of the true value of what they administer."

‡ This law, enacted October 21, 1639, was "An Act to compel physicians and surgeons to declare on oath the value of their medicines." It was revised and amended at the session of the colonial legislature of Virginia in 1645, and again in 1657. (Hening's Statutes of Virginia, Vol. I, pp. 316 and 450.)

§ Toner's Contributions to the Annals of Medical Progress, etc., 1874, p. 36.

|| *Ibidem*, pp. 37, 41, 48, 50, 78.

¶ *Ibidem*, p. 62.

** *Ibidem*, p. 69.

in the status and condition of the healing art in the States. The British army was accompanied by a good medical staff, most of whose members landed in New York or Boston, and remained for several years in the neighboring territories, affording many young Americans opportunities to attend the British military hospitals and receive professional instruction. The physicians of the Anglo-American army gained the confidence of the settlers by their superior proficiency and deportment. After the conclusion of the French and Indian War in 1763, the military establishments in the colonies adjoining Canada required medical attendants, and thereby the people had for some years the benefit of the service of a superior class of medical men and young Americans the opportunity for better medical instruction. Yet, in general, the traditional license continued unabated; every one who had the necessary assurance and the confidence of his neighbors could practice the healing art. In consequence, all grades of tutored, clerical, and illiterate medical practitioners ventured upon the practice, and attended their victims with equal assiduity and mutual forbearance.* The remuneration, however, was small, mostly consisting in pay for medicines. Most practitioners, particularly in the rural districts, had to adopt some subsidiary occupation, generally farming and horticulture.

The War of Independence afforded the second opportunity to bring a number of proficient European physicians to the colonies, both English and continental. Quite a number of them settled in the States after the close of the war, and became prominent in their profession, as well as in the councils of the young republic, while others explored the country and

* It is probable that at the time when the War of Independence commenced, and no American degrees existed, there were hardly more than 400 physicians holding a European degree in all the colonies; and yet the number of medical practitioners amounted to about 3,500. (Toner, Contributions to the Annals of Medical Progress, etc., 1874, p. 106.)

The condition of medicine in the colonies at that time is described in Smith's History of New York, p. 326: "Few physicians amongst us are eminent for their skill. Quacks abound, and too many have recommended themselves to a full and profitable practice and subsistence. Any man at his pleasure sets up for physician, apothecary and surgeon. No candidates are either examined or licensed, or even sworn to their practice."

Dr. Johann David Schoepf, of Bayreuth, traveling in Pennsylvania and the adjoining States in the years 1783 and 1784, reports about the condition of medicine in the New World, that for want of any valid statutes every one is at liberty to practice the healing art and to dispense medicines. No discrimination is made between regular physicians and illiterate cure-alls. He recalls a recent controversy between the regular practitioners and the quacks in Connecticut. The former demanded that the latter pass an examination before a medical board. These resented such interference, and the Assembly of the State decided in favor of the irregulars and against any monopoly in the practice of medicine. (Reise durch einige der mittleren und südlichen Vereinigten Staaten in den Jahren 1783 und 1784, Erlangen 1788, Vol. I, p. 107; and Pharmac. Review, Vol. 16 (1898), p. 301.)

furnished comprehensive and valuable reports about its natural resources.* Nor had there been any difficulty in finding a sufficient number of competent physicians and surgeons for the hospital and field service of the Federal armies.

FIRST RECORDS OF APOTHECARIES.

At this time we find the first records of apothecaries † being appointed to hospital service. In an enactment of the Continental Congress, passed July 27, 1775, for the establishment of a hospital for the Federal army, consisting of 20,000 men, among the officers and other attendants there are named: One director general and chief physician with a pay of \$4 per day; four surgeons with a pay of \$1.50 per day, and one apothecary with a pay of \$1.34 per day.‡ Another appointment recorded was that of Christoffer Marshall, of Philadelphia, "a well known druggist and much respected member of the Society of Friends," who was commissioned in 1776 "to look after the needs of the sick and wounded in the hospitals of Philadelphia."§

In various subsequent records, apothecaries are mentioned as appointees in the United States army service.||

* Foremost among them was Dr. Johann David Schoepf, surgeon of the Hessian troops sent to America in the year 1776. He remained until the year 1784, and after his return published in 1787 and 1788 two works on the natural history of the United States: "*Materia medica americana potissimum regni vegetabilis*," Erlangæ, 1787, and "*Reise durch einige der mittleren und südlichen Vereinigten Nordamerikanischen Staaten in den Jahren 1783 und 1784*." Two volumes. Erlangen, 1788.

† By the first act relating to the practice of medicine in England passed in the year 1511, this was vested in one class of men, "the faculty of medicine," privileged to practice medicine, surgery and pharmacy. In this law the apprentices and assistants of the practitioners were termed "apothecaries;" it seems that their functions consisted, as subsequently did those of the medical apprentices in the colonies, in the exercise of minor surgical work like dressing wounds, extracting teeth, bleeding, applying the syringe, and particularly in the preparation of medicines and the compounding of the prescriptions of their preceptors. They acquired more specially the rudiments of the art of pharmacy, and in time established themselves as "apothecaries" in the sense of the British law. They formed a special guild as dealers in drugs and medicines, and were incorporated as "apothecaries" with the "grocers" into one corporation by an act passed in the year 1606, but were separated again in 1617.

Since our country inherited in the initial stages of national development the medical traditions, usages and titles from England, the amalgamation of and interests in the branches of the healing art descended to the United States, and the race of apothecaries in the English sense kept on flourishing with us up to within the first half of the 19th century.

‡ Packard, History of Medicine in the United States. 1901, p. 256.

§ Diary of Christoffer Marshall. Edited by Wm. Duane. Philadelphia, 1839.

|| Among them Dr. James Cutbush, in 1814, "Assistant Apothecary General" in the army, and from 1820 to his death in 1823 Acting Professor of Chemistry and Mineralogy at the United States Military Academy at West Point. (Journal of the Americ. Chemical Society, vol. 19 (1897) for August.)

GRADUAL SEPARATION OF THE PRACTICE OF PHARMACY FROM
THAT OF MEDICINE.

After the final establishment of the Federal States, and the return of peace and settled conditions, agriculture, commerce and trades increased and prospered, as did also the class of educated and proficient physicians. The more successful and busily engaged ones gradually relegated the preparation and dispensation of medicines to those less successful, or who were more devoted to or engaged in materia medica and the preparation of medicines, and dealers in drugs and medicines. These, as well as pharmacists by education and those who had come from abroad, more and more relieved the more occupied physicians from the traditional dispensing part of their functions. In this way a differentiation between prescribers and dispensers of medicine was gradually taking place. This dissociation was at first publicly advocated by an eminent American practitioner and professor of medicine, Dr. John Morgan, of Philadelphia, who, after his return from the University of Edinburgh in 1765, proclaimed the principle that medical men henceforth should confine themselves to prescribing, leaving to the apothecary the preparing and compounding of medicines.

This dissociating evolution of the co-ordinate professions, however, was a slow one, mainly because the remuneration of most medical practitioners consisted, according to old custom, chiefly in the charge for medicines dispensed, and it was no easy task to accustom the people to separate charges for medical treatment and for medicines, or, in other words, for the service of the physician and of the pharmacist.

During all these years there seems to be no mention in public print of apprenticeship in pharmacy or the drug trade, although a discrimination must have been made between the medico-trained young men engaging in pharmacy and those, less tutored, who perhaps incidentally entered the general merchandise business or so-called "country stores," where all sorts of commodities, among them drugs and medicines, were kept for sale, and who then, perhaps without any real apprenticeship, branched out into the drug trade.

The long prevailing close association of the professions, and the diversity in the dual practice of the medical art vested in one person, served to retard a final separation, as also the founding of medical institutions, by reducing the number of those possessing special executive and tutorial talent. In consequence the more qualified and ambitious students of medicine, as mentioned before, continued to seek the completion of their medical education abroad for want of established medical schools and institutes at home. Even students of divinity often took advantage of European universities to attend medical lectures and clinics, and "walk the hospitals," as it was termed. Not a few of them received the doctorate in medicine, and became afterwards, as instanced on page 1, eminently successful in both professions.

ESTABLISHMENT OF MEDICAL SCHOOLS AND HOSPITALS.

The collective study of medicine commenced slowly and sporadically, and was initiated by able and high-minded practitioners with small classes of students, either independently or in connection with private or public hospitals. These, as well as the courses of instruction, were generally modeled after or copied from British prototypes. The first collegiate courses of lectures to medical students were instituted in Philadelphia and New York in the middle of the 18th century.* The first public hospital was the Pennsylvania Hospital in Philadelphia, opened in the year 1752;† the first Dispensary for free distribution of medicine among the poor was opened in Philadelphia in the year 1786 and in New York in 1791.

The founders of the first American medical school‡ were two young Philadelphians, William Shippen, Jr. (born 1736, died 1808), and John Morgan (born 1735, died 1789), who, after having served their apprenticeship with medical practitioners in Philadelphia, completed their education at the universities in London and Edinburgh. They took their degree in medicine at the latter university, Dr. Shippen in 1761; Dr. Morgan in 1763. It appears that they, while in Europe, conceived the idea of establishing a medical school at home, and on their return they joined the "College of Philadelphia," a medical society founded in the year 1749, as a basis for the realization of their aims. In the year 1765 Dr. Morgan was appointed Professor of the Theory and Practice of Physic, and Dr. Shippen, Jr., Professor of Anatomy and Surgery, and the school was opened in the fall of the year 1765. On the return of their younger friend, Dr. Benjamin Rush (born 1745, died 1813), from Edinburgh in the year 1768,§ he was appointed, August 1, 1769, Professor of Chemistry, and

* Bulletin of the Johns Hopkins Hospital. Baltimore, July-August, 1900.

† The second one established was the Hospital of the City of New York, chartered in 1771, but not opened until 1791, and before members of the medical faculty of Columbia College had established a college apothecary shop at public expense for giving their services and medicines free to the sick poor. (Contributions to the History of Medical Education and Medical Institutions, By N. S. Davis, 1877, p. 21.)

‡ The medical school of "King's College" in New York, founded in 1754, was organized in 1768; in the year 1811 it was united with the "College of Surgeons and Physicians," founded in 1807. The medical school of "Harvard University" was opened in 1783; of "Dartmouth College" in 1797, and of the "University of Maryland" in 1807. Chemical study as a correlative branch of the curriculum of medical study was first recognized and introduced in the "College of Philadelphia," subsequently the "University of Pennsylvania" in the year 1768; in "King's College" (since 1782 "Columbia College") in New York in the year 1769; in "Harvard University" in the year 1783; in "Dartmouth College" in 1798, and in the "Maryland College of Medicine," in Baltimore, in the year 1808.

§ In a letter of January 20, 1768, to Professor John Morgan, Dr. Rush wrote: "I thank you for the pains you have taken to secure me the professorship of chemistry. I have attended Dr. Black in Edinburgh University for two years diligently, and have re-

opened in the fall of that year the first course of lectures in chemistry in a medical school in the United States.*

It is an interesting fact and an evidence of the discerning wisdom of the founders of the first medical school in the country that they should have recognized the art of pharmacy as a special branch of that of medicine, and conceived from the beginning of the new school the idea of including pharmaceutical instruction in the course of lectures. In the official announcement of the opening of the school it is stated that, "in order to render the courses of lectures the more extensively useful, it is intended to introduce into them as much of the theory and practice of physic, of pharmacy, and chemistry as can be conveniently admitted."† Probably for the reason that no properly qualified instructors were to be had at the time, a chair of materia medica and pharmacy was not installed before the year 1789, shortly before the consolidation of the school with the "University of Pennsylvania," when Dr. Samuel P. Griffith was appointed professor of these branches, while a chair of materia medica and botany ‡ had already been instituted in the year 1768 by the appointment of Dr. Adam Simon Kuhn.

ESTABLISHMENT OF MEDICAL ASSOCIATIONS.

In conformity with the growth and advance of the scientific and professional spirit in the rising civilization, and with the increase and progress

ceived from him a comprehensive and accurate view of the science, together with all its late improvements in chemistry. There is scarcely one of his experiments but what I have seen twice performed." (Packard, History of Medicine, etc., 1901, p. 281.)

* When the "University of Pennsylvania" was established in 1779, the medical school of the "College of Philadelphia" was much crippled, but continued its functions until the year 1791, when the medical departments of both rival schools were united under the auspices of the "University of Pennsylvania" by an act of the Legislature of the State, September 30, 1791. In place of Dr. Benjamin Rush, Dr. James Hutchinson took the Chair of Chemistry in 1789, and Dr. B. S. Barton the Chair of Botany and Natural History, while Dr. S. P. Griffith continued in the Chair of Materia Medica and Pharmacy.

As being of historical interest, it may be mentioned that Dr. Joseph Priestley, on his arrival from England in the year 1794, was invited to take the Chair of Chemistry in the Medical Department of the "University of Pennsylvania" in place of Dr. Hutchinson, who had died a few months previously. He was also offered the Chairmanship of the Philadelphia Chemical Society, founded in 1792, but declined both, preferring quiet retirement in the town of Northumberland in the Susquehanna valley in Pennsylvania.

† Pennsylvania Gazette, Philadelphia, September 26, 1765.

‡ At that time Philadelphia had the first botanical garden established in the country, that of John Bartram, founded in the year 1728; later on two more botanical gardens in Philadelphia became noted, those of Hamilton and of Marshall. They existed until the end of the 18th century. The botanical garden of Dr. Hosack, in New York, known as the "Elgin Garden," existed from 1801 to 1816. (Pharmac. Rundschau, Vol. VII (1889), p. 52, and Vol. X (1892), p. 94; Popular Science Monthly, Vol. XXXV (1889), p. 105.)

of higher professional education and attainments in the course of years, associate activity and the requirements for greater proficiency in the professions and arts became more and more manifest, giving rise, among other developments, to the organization of scientific, professional, and trade associations. The oldest of such American societies is the "American Philosophical Society," established in Philadelphia by Benjamin Franklin in the year 1743. Next to it in age were the "Medical Society of Boston," founded in the year 1751, the "Philadelphia Medical Society" and the "Litchfield County Medical Society of Connecticut," both organized in the year 1765, the "New York Medical Society" and the "New Jersey Medical Society," both founded in the year 1766, the "American Academy of Arts and Sciences," in Boston, in the year 1780, the "Chemical Society of Philadelphia," in 1792, and the "Columbian Chemical Society," in Philadelphia, founded in 1811.* Many of these, as well as of other later organized associations, however, were only short-lived and without any marked influence upon the progress of science.

PHARMACISTS AND DRUGGISTS.

With the constant increase of the population and the intellectual, material and industrial progress in the course of the last quarter of the 18th and the first quarter of the 19th century, a stricter specialization asserted itself in arts, trades and the professions. Education, both higher and elementary, had improved and extended, the public press had been enlarged and the standards of professional requirements and proficiency raised. Medical education and skill had been correspondingly advanced, and with the increase and influence of a superior class of medical practitioners a stricter discrimination in the arts of medicine and pharmacy gradually asserted itself. Many of the old-time general merchandise stores had become transformed into drug stores and dispensing apothecaries' shops conducted by men grown up and experienced in the trade, or by the prevailing stock of men originally trained by medical practitioners, and, to a much smaller extent, by pharmacists who had immigrated from European countries.† The gradual amalgamation of this variety of pharmaceutical practitioners required quite a time for its final combination into one uniform profession with common aims and interests.‡

Local and sectional associations of the better educated and more favorably situated non-dispensing medical practitioners had gradually been organized, frequently excluding those who had engaged mainly in the compounding, dispensing and sale of medicines and drugs, that is, who

* H. Carrington Bolton, "Early American Chemical Societies," in *Journal of the American Chemical Society*, Vol. XIX (1897), August.

† J. D. Schoepf: "Reise durch einige der mittleren und südlichen Vereinigten Staaten," etc., Erlangen 1788, Vol. I, p. 121, and *Pharmac. Review*, Vol. XVI (1898), p. 298.

‡ It may be said that this ripening process has been a continuous one ever since, in

had become dispensing pharmacists and druggists rather than medical practitioners. These again, left more or less outside of the association of their former confreres, in time associated themselves with their fellow druggists and apothecaries for mutual protection and for the improvement and advancement of their professional position and trade interests. In this way the path for the organization of pharmaceutical associations and colleges of pharmacy was step by step paved.

ESTABLISHMENT OF SCHOOLS OF PHARMACY.

The number of medical colleges instituted by associate or individual enterprise had constantly increased, mostly with satisfactory material success, but without any efficient restriction in the admittance of students as to their preliminary education and qualification. In time it must have become a matter of serious concern with the better educated and more discerning pharmacists and druggists, particularly in the larger cities, to secure for their assistants a somewhat corresponding collegiate instruction.

In conformity with their prototypes, the English universities and medical schools, the early American universities and colleges of medicine had persistently disregarded the education of those students bent more upon the study and practice of pharmacy than that of medicine. Great credit is due to the University of Pennsylvania for renewing, in the year 1819, the early efforts of its precursor, the "College of Philadelphia," in 1765, as mentioned on page 9. It was the first to again conceive the idea of offering to the meanwhile more consolidated pursuit of the pharmacist a suitable course of collegiate education based on the substratum of the preparatory store experience. The trustees of the University resolved at a meeting held August 3, 1819, that the Professor of *Materia Medica* henceforth be styled "Professor of *Materia Medica* and *Pharmacy*," and that the teaching of the pharmaceutical art should be a part of his duties. These lectures at the Medical School of the University seem to have been well attended by pharmaceutical students in the winter term of 1820 to 1821. At a meeting held February 6, 1821, the trustees of the University fixed the conditions under which the degree of "Master of Pharmacy" should be conferred upon pharmacists who had served an apprenticeship of at least three years with a respectable apothecary, and passed an examination before the Professors of *Materia Medica*, Chemistry and Pharmacy. "But hereafter it shall be requisite for obtaining the degree that the candidates shall have attended at least two courses of lectures on chemistry,

consequence of the constant European immigration. This reached its maximum during the entire second half of the 19th century, when American pharmacy was invaded by a mass of new comers of diverse professional qualification, mainly from Germany and Scandinavian countries. Their influence on American pharmacy, however, has been a marked one, particularly in states and cities with a large foreign population.

materia medica and pharmacy in the University." At the commencement, April 5, 1821, sixteen candidates received the degree.*

This first attempt of an American university to recognize pharmacy as a co-ordinate branch of the healing art, and to offer to students of pharmacy also an academic collegiate education and degree, however, was checked by the action of a number of pharmacists of the city of Philadelphia, who objected to this innovation. They formed, February 23, 1821, soon after the action of the trustees of the University, a local organization, and resolved at subsequent meetings held March 3 and 27, 1821, to establish a school of their own, to be managed by themselves, under the name of "College of Apothecaries." Two medical lecturers, Dr. Samuel Jackson and Dr. Gerard Troost, of Philadelphia, were engaged,† and the initial course of lectures on chemistry and materia medica was delivered during the winter months of the year 1821 to 1822. The school was incorporated as the "Philadelphia College of Pharmacy" on March 30, 1822.‡

Pharmaceutical organizations of other cities followed suit by also founding Colleges of Pharmacy; of these the older ones are: Boston in 1823, New York in 1829, Baltimore in 1841, Chicago in 1859, Cincinnati in 1870, St. Louis and Louisville in 1871, San Francisco in 1872, and Washington, D. C., in 1873.§ The first established colleges experienced hard struggles for existence, and were of slow growth. They had to employ for many years medical graduates as instructors, and to confine their courses of lectures to materia medica, botany and chemistry. The service of phar-

* Not until the establishment of State universities many years later was this initial movement repeated. The University of the State of Michigan was the first to institute a 'Department of Pharmacy' in the year 1868; the University of Wisconsin followed in 1883, and Cornell University of the State of New York in 1887. The former two, with a full staff of professors, have been successful from the start; the latter had to abandon the venture in the year 1890. A number of other State universities have since established Departments of Pharmacy with varying success.

† The prominence of medical men among the professors of the early Colleges of Pharmacy is readily explained. Up to the first decades of the 19th century, the only collegiate education in the natural sciences open to American students was that offered by the medical schools. These were the home of all that existed of instruction in materia medica, chemistry and botany. In consequence the chairs in these and other branches of physical sciences were held in those days almost exclusively by medical graduates, whose education more nearly qualified them for teaching these branches of knowledge than the graduates of the classical courses common to all the higher colleges.

‡ The moving spirit in this action seems to have been Daniel B. Smith, born in Philadelphia in the year 1792, died there in 1883. He was the first Secretary of the College, and was elected its President in 1829. Mr. Smith was the first contributor to the initial number of the "American Journal of Pharmacy" in the year 1825; the only pharmaceutical contributor to the first edition of the "United States Dispensatory" in 1833, and the first President of the "American Pharmaceutical Association" in the year 1852.

§ Other technical colleges began to be established during these years. The oldest one, the "Rensselaer Polytechnic Institute" at Troy, N.Y., was founded in the year 1824; the

maceutical instructors, and the introduction of experimental and operative courses in pharmacy and pharmaceutical chemistry, could not be secured before the year 1841 in the Maryland, 1846 in the Philadelphia, and 1861 in the New York College.* Instruction in chemical analysis and in the application of the microscope in pharmacognosy were added many years later after the publication of the first works on the examination of medicinal chemicals, and on structural organic materia medica in the United States,† as also after the several lectures, demonstrations and discussions on the usefulness and value of microscopic examination of drugs and drug powders.‡ A number of Colleges of Pharmacy have more recently extended and completed their laboratory appointments and instruction, and have supplemented them by the addition of special courses in pharmaceutical assaying; in the art of dispensing; in instruction in bacteriological methods, and in commercial book-keeping.

While the collegiate instruction consisted for many years in didactic lectures only, offered to evening classes on three or four evenings each week through the four or five winter months, just sufficient to engage the student's scientific interest and to assist him in his studies in the store and at home, this anomaly has been abandoned in the course of years and with the increasing stricter demand for knowledge and proficiency. The lecture courses have gradually been extended to six or eight months each term, and to lectures and practical laboratory and microscopic work during the day as well, until now two to three full courses, each covering six to eight months per year, are required as a condition for graduation. It was a great advantage and conducive to superior results of the earlier university schools of pharmacy, equipped with a full faculty and ample

"Sheffield Scientific School" of Yale University in the year 1846; the "Lawrence School" of Harvard University in 1847; the "Massachusetts Institute of Technology" in Boston in 1861; the "School of Mines" of Columbia College in New York in the year 1864.

* By the appointment of Profs. Geo. W. Andrews and Thos. Mackenzie in Baltimore, Prof. Wm. Procter, Jr., in Philadelphia, and Profs. Ferdinand Feist Mayer and John M. Maisch in New York. Andrews and Mackenzie were the first practical pharmacists appointed respectively to the chairs of chemistry and pharmacy in 1841; they began their course of lectures in November of the same year. Prof. Procter was appointed to a pharmaceutical chair in the year 1846, and in October, 1847, commenced his lectures by an introductory address published in Volume XIX (p. 241) of the American Journal of Pharmacy.

† "Manual of Chemical Analysis as applied to the examination of medicinal chemicals." By Frederick Hoffmann, New York, 1873. "Manual of Organic Materia Medica." By John M. Maisch, Philadelphia, 1882.

‡ Proceed. Amer. Pharm. Assoc., Vol. XVI (1868), p. 105. Vol. XVIII (1870), pp. 299, 304. Vol. XXIV (1876), p. 679. Vol. XXV (1877), pp. 379, 565. Vol. XXXVI (1888), p. 231. Vol. XXXVIII (1890), p. 252. Druggists' Circular, 1874, p. 57. (Reprinted in Pharmac. Era, Vol. XII (1894), p. 341 and in Pharmaceut. Journ. and Transact. (London), 3d series, Vol. V (1874), p. 781.)

laboratory and museum appointments, that they at once installed the pharmaceutical students into the general classes of the respective branches and required attendance at all the lectures and laboratory work.

PRODUCTION OF A NATIONAL PHARMACOPŒIA.

During the many years of evolution and growth of the two co-ordinate professions, medicine and pharmacy, there existed no American standard work defining the nature and quality of medicinal drugs and chemicals, including the preparation, composition and strength of pharmaceutical products. British, French and German books were indiscriminately used as authorities for these purposes, as well as for deciding upon the identity and quality of drugs, chemicals and medicinal preparations to be admitted through the custom-houses at our ports of entry, and as reference works in materia medica and pharmacy. The first attempt towards emancipation from European standards and towards the creation of an American pharmacopœia * was made by the Philadelphia College of Physicians, in June, 1788, by appointing a committee, which for several years was active in securing the co-operation of eminent professors and practitioners of medicine towards the realization of a national pharmacopœia.† These efforts, however, seem to have remained without any practical results.

Subsequently, the Massachusetts Medical Society in Boston, organized in the year 1780, resolved in October, 1805, to replace the British standards, as represented by the London, Edinburgh and Dublin pharmacopœias and dispensatories, then in common use in the United States, by an American pharmacopœia. A draft for such a one was elaborated by two eminent Boston practitioners of medicine, Dr. James Jackson and Dr. John Collins Warren. Their work was approved by the Society and published in the year 1808 under the title, "The Pharmacopœia of the Massachusetts Medical Society."

Meanwhile a first, and widely recognized and used, "American Dispensatory" had been published in the year 1806 by Dr. John Redman Coxe,

* The diminutive formulary published in 1778 by Dr. William Brown, Surgeon in the Federal army, then in charge of the "Continental Army Hospital" at Lititz, a Moravian village in Lancaster Co., Pa., maintained from December, 1777, to August, 1778, was entitled: "Pharmacopœia simpliciorum et efficaciorum, in usum nosocomii militaris, ad exercitum foederatarum Americæ civitatum pertinentis, hodiernæ nostræ inopiæ rerumque angustiis, feroci hostium saevitiæ, belloque crudeli et inopinato patriæ nostræ illato debitis, maxime accommodata." This small formulary of only 32 duodec. pages (reprinted in *Americ. Journ. Pharm.*, September, 1884, and described in *Proceed. A. Ph. A.*, Vol. XXXVIII (1890), p. 89) was intended exclusively for the use of the surgeons in the few temporary hospitals of the Federal army during the War of Independence.

† Dr. W. S. W. Ruschenberger, "Account of the Institution and Progress of the College of Physicians of Philadelphia during 100 years, from 1787 to 1887." Philadelphia, 1888.

Professor of Chemistry in the medical department of the University of Pennsylvania. In the year 1810 another dispensatory was published, by Dr. James Thacher, of Boston, under the title, "The American New Dispensatory, issued with the sanction of the Massachusetts Medical Society;" it had as its basis the pharmacopœia of Jackson and Warren.*

On account of prevailing doctrinal dissensions between the various medical sects and schools, and sectional rivalries among the rising States and cities, the early efforts towards common and uniform action in this matter seem to have been checked. In the year 1815 the physicians and surgeons of the "Society of the New York Hospital," organized in 1767, appointed Dr. Samuel Latham Mitchill † and Dr. Valentin Seaman a committee to prepare a pharmacopœia for the use of the hospital. Their work was published in the year 1816 under the title, "Pharmacopœia Nosocomii Neo Eboratensis." It contained, among other novel features, a list of maximum doses of potent remedies.

Neither of these two initial pharmacopœias of Boston and of New York met with any further adoption than local use. Hereupon, Dr. Lyman Spalding, of Cornish, N. H., then in New York, conceived, in the year 1816, the idea of compiling a national pharmacopœia, and in January, 1817, submitted to the Medical Society of New York a plan, approved by the New York College of Physicians and Surgeons, for the formation of such a one, to be elaborated and published under the auspices of the incorporated medical societies and colleges of the United States. He suggested that a convention of delegates of the medical societies and colleges be held in each of the four great geographical divisions of the country, and that each prepare a draft of a pharmacopœia, which should be submitted to a national convention to be held in the city of Washington, D. C. Twelve medical societies and seven medical colleges adopted this plan and consented to be represented by delegates at the proposed national conference to be held in Washington in January, 1820.

Only two district conventions, however, were held in June, 1819, one of the New England States, in Boston, and the other of the Middle States, in Philadelphia. The general convention for the formation of a national pharmacopœia met in the city of Washington, D. C., on January 2d, 1820,

* The dispensatory of Coxe was re-issued in six consecutive revised editions, the last one appearing in the year 1831. The dispensatory of Thacher was re-issued four times, the fourth edition appearing in the year 1821.

† Dr. Elisha Hubbard Smith, of New Haven, Conn., the father of American medical journalism, started in conjunction with Professor Sam. L. Mitchill and Dr. Edward Miller in New York, in the year 1797, the first American medical journal "The Medical Repository." Dr. Smith died in the year 1798, and the journal, devoted to medicine as well as to general medical and physical sciences, was successfully continued until the year 1824 by Dr. Mitchill, who was the first professor of chemistry in the United States who adopted and introduced the doctrine and chemical nomenclature of Lavoisier. He published in the year 1794 an essay on the "Nomenclature of the New Chemistry."

under the presidency of Professor Samuel Latham Mitchill, of New York. The two drafts presented by the district conventions held at Boston and Philadelphia were compared, revised and consolidated into one work, which was adopted by the convention for publication, under the editorial supervision of Dr. Lyman Spalding. This work was published in Boston and issued December 15, 1820, under the title, "*The Pharmacopœia of the United States of America*. By the authority of the Medical Societies and Colleges." A second reprint had to be issued in the year 1828. The convention had also provided for a decennial revision and republication of the work.

The several efforts made since the year 1788 for the realization of a native pharmacopœia were thus brought to a satisfactory and practical result in the year 1820.

The subsequent first decennial revision of the work, in the year 1830, resulted, partly through rivalry, partly through misconception, in the edition of two rival pharmacopœias, one issued in New York, the other in Philadelphia. At the subsequent decennial revision, in the year 1840, this dissonance disappeared. These revisions were undertaken and made exclusively by physicians. At the revision in the year 1850, delegates of the Colleges of Pharmacy in Philadelphia and New York were invited for the first time, and admitted to the pharmacopœial convention.

PARTICIPATION OF PHARMACISTS IN THE DECENNIAL REVISIONS OF THE PHARMACOPŒIA.

A plan presented to both the American Medical Association and the American Pharmaceutical Association at their annual meeting in Philadelphia in the year 1876, that the former Association take absolute charge of the further revision and publication of the Pharmacopœia,* was rejected by the Medical Association at its subsequent meeting in Chicago in the year 1877,† while the American Pharmaceutical Association at its annual meeting in Toronto, in the year 1877, promptly adopted a resolution, as the representative organization of American pharmacy, henceforth to undertake, or at least to more efficiently participate in, the decennial revisions and the editing of the United States Pharmacopœia.‡ In consequence of this action, the elaboration of the revisions of the Pharmacopœia became henceforth more prominently the work of pharmacists, and the

* Proceed. A. Ph. A., Vol. XXIV (1876), p. 633. Vol. XXV (1887), p. 531.

† The problem of the further issue of the Pharmacopœia brought about quite a controversy in the medical and pharmaceutical journals of the years 1876 and 1877, as well as a number of monographs and rejoinders, foremost among them discourses and papers by Edward R. Squibb, Horatio C. Wood, Alfred B. Taylor, The Philadelphia County Medical Society, The College of Pharmacy of the City of New York, The National College of Pharmacy and others.

‡ Proceed. A. Ph. A., Vol. XXV (1877), pp. 532-538 and 553-569.

number of pharmaceutical members in the Committee of Revision has constantly increased. This Committee consisted in the year 1850 of seven physicians and two pharmacists, and it was due to the progressive influence of these that the process of displacement or percolation had already been first introduced into the United States Pharmacopœia of the year 1843.* In the revision convention of the year 1860, four Colleges of Pharmacy were represented by delegates, and the Committee of Revision consisted of five physicians and four pharmacists. In the revision of the year 1870, seven Colleges of Pharmacy were represented, and the Committee of Revision consisted of ten physicians and five pharmacists. In the convention of 1880, eleven Colleges of Pharmacy were represented, and the Committee of Revision consisted of twelve physicians and thirteen pharmacists. This convention decided upon the abandonment of measures of capacity and the adoption of parts by weight for expressing quantities. Among the various suggestions and papers submitted to the Committee of Revision was an elaborate contribution from the American Pharmaceutical Association, which was adopted and used as a basis in the revision of the sixth edition of the Pharmacopœia.†

The convention of the year 1890 included in its constituency not only incorporated Colleges of Pharmacy, but also for the first time delegates of incorporated pharmaceutical societies and of the American Pharmaceutical and American Medical Associations. It elected a Committee of Revision consisting of fourteen physicians and twelve pharmacists, of whom seventeen out of the whole number of twenty-six were members of the American Pharmaceutical Association. A resolution was passed at this convention henceforth to employ exclusively metric units.

CONDITION OF THE DRUG MARKET BEFORE THE ORGANIZATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

While medicine and pharmacy in the course of the last quarter of the 18th and the first quarter of the 19th centuries had secured an intrinsic and substantial foundation for greater proficiency and higher advance, there still remained as an obstacle to the efficient exercise of their functions as conservators of the healing art, and to the public weal, an undiminished laxness and a lack of exacting control respecting the quality of drugs and medicines of native and foreign production, as well as to the unchecked trade in poisons, and a want of proper restriction in the admission to and exercise of the professions.

* The credit of first making percolation an official process in a Pharmacopœia belongs to the Edinburgh Pharmacopœia of the year 1840, published in 1839, which gave an explicit description of the process. (Chemist and Druggist, Vol. LV (1897), p. 922. Proceed. A. Ph. A., Vol. XLV (1897), p. 376.) The United States Pharmacopœia of the year 1840, also introducing percolation, did not appear until the year 1843.

† Proceed. A. Ph. A., Vol. XXVII (1879), p. 667.

Notwithstanding the creation of a national pharmacopœia, the establishment of Colleges of Pharmacy, and of some improvement in the proficiency of college bred pharmacists, the drug market remained, as to quality, in an unsatisfactory and deficient condition.

Although a number of enactments in regard to sanitary measures, and the practice and charges of medical practitioners, during the colonial period are on record, little seems to be known about legislative statutes relating to the inspection and control of the quality of drugs, chemicals and medicinal products of commerce passing from the mother country to the colonies.* After the establishment of the United States, this abnormal condition seems to have continued unabated for want of efficient statutes and authorities. In consequence the ports of the United States have ever since been a convenient and profitable dumping-ground for spurious, inferior and adulterated drugs and chemical products.

With the gradual increase of commerce, trades and arts, the need of a more exact control of the quality of the multiplying mass of merchandise and commodities of all kinds passing through the custom-houses, among them particularly drugs and medicinal products, became more and more urgent. This exigency was an efficient incentive to various movements for a change to the better, and among druggists and pharmacists had given rise to the formation of local societies and associate action. This fact and the voice of medical authorities and societies did not fail, in time, to bring about a wider and deeper cognizance of, and arouse indignation against, the prevailing discreditable condition of the drug market. Yet twenty-five years still elapsed after the publication of the first issue of the national pharmacopœia, and the first graduation of pharmacists by the University of Pennsylvania and the establishment of the first college of pharmacy, before the apprehensions and loud protests of pharmacists and physicians induced Congress to rise to the emergency and to pass, in the year 1846, a drug law for an inspection and control of imported medicinal drugs and chemicals. Although intelligently framed, the law, which seems not to have gone into operation before the year 1848, was deficient in several essential provisions. It failed to prescribe any standards of quality for drugs and chemicals, nor was any appropriation made for requisite books, apparatus, etc., for the use of the drug examiners. Everything was left to their option, requiring them merely to form and express

* The condition of the drug market in England seems to have been a very poor one in earlier times, so much so that a "Society of Apothecaries" had been organized in London in the year 1617, for mutual protection against the prevailing gross adulteration of drugs and medicines. This move proved so successful that the Society opened in the year 1671 a laboratory, which already had been instituted in the year 1623, for manufacturing medicinal chemicals and galenicals of a better and more reliable quality. The products met with appreciation and much demand. (Bell and Redwood, *Progress of Pharmacy in Great Britain*. London, 1880, p. 13.)

their opinion, according to their proficiency and notions, about the quality and value of drugs, chemicals and medicinal preparations imported into the United States. The main cause, however, why the law failed to bring about a prompt change for the better seems to have been the fact that in the appointment of the drug examiners political partisanship was placed above qualification and character. In consequence, incompetence and laxness in the proper application of the law contributed largely to defeat the aims and objects of the enactment.

A PROTEST AGAINST THE FAILURE OF THE DRUG LAW OF 1846.

It is a credit to the pharmacists that the disappointment experienced in consequence of the failure of the drug law to promptly and efficiently remedy the inferiority of the drug market induced them to take united action, which resulted in the formation of the American Pharmaceutical Association.

In August, 1851, the College of Pharmacy of the city of New York issued an invitation to the colleges of pharmacy at Philadelphia and Boston to hold a conference of delegates for the consideration and adoption of measures and standards more suitable and efficient than the prevailing ones, for the guidance of the drug examiners at the ports of entry, whereby their action might be rendered more uniform, exacting and reliable, as well as to consider expedients calculated to elevate the profession and promote its interests throughout the country. Pursuant to this call delegates from each of the three then existing colleges of pharmacy convened at the rooms of the New York College on October 15th and 16th, 1851, Mr. Chas. Ellis, of Philadelphia, acting as chairman, and subsequently Dr. Chas. B. Guthrie, of New York, as president.

Significant of the motives for and the aims of this preliminary conference is the adoption of the following report and resolutions offered by a committee of the convention, of which Professor Wm. Procter, Jr., acted as chairman :

"This convention considers the law of the year 1846, relating to the inspection and passage of drugs at the custom houses, ample enough in its general provisions in guarding the admission of drugs, medicinal substances, and preparations, under the reference which it distinctly requires to the Pharmacopœia and dispensatories, specified in it. The convention, however, earnestly recommends, as the useful working of the law, after all, depends mainly on the integrity and ability of the examiners, that the greatest care should be exercised by the appointing power in the selection of these officers, in furtherance of which the colleges of pharmacy would cheerfully render their assistance, if solicited."*

It was also resolved that a convention be called, consisting of three delegates each from all pharmaceutical organizations, to meet in Philadelphia

* Minutes of the Convention of Pharmacists and Druggists, held in the City of New York, October, 1851, p. 6.

in October, 1852, with a view of considering all the important questions bearing on the profession and its elevation and advance, as well as for mutual protection, and for adopting measures for the organization of a national association of pharmacists, to meet once every year.* In conclusion a committee was appointed for the purpose of collecting such information as might be valuable, together with memorials and suggestions from medical and pharmaceutical associations, and to present them at the next meeting.

CONVENTION FOR THE ORGANIZATION OF A NATIONAL PHARMACEUTICAL
ASSOCIATION.

On the call of Dr. C. B. Guthrie, the Chairman of the preceding conference in New York, the convention assembled in the rooms of the Philadelphia College of Pharmacy on October 6, 7 and 8, 1852. It consisted of delegates of the Colleges of Pharmacy from Philadelphia, New York, Boston, Baltimore and Cincinnati; from the Richmond Pharmaceutical Society, and of representative pharmacists from Connecticut and San Francisco, in all about twenty-four participants. Mr. Daniel B. Smith, of Philadelphia, was elected Chairman. The committee appointed at the preliminary conference in New York in the year 1851 for collecting such information as might be conducive to the objects and aims of the subsequent convention in Philadelphia, reported as follows: †

1. "That the present convention resolve itself into a national association, with the object to benefit, from a professional point of view, the large number of pharmacutists scattered throughout the United States, there existing many grounds of sympathy between them, which may better manifest themselves by united action. It is therefore recommended not alone to accept delegates from pharmaceutical associations to membership, but also respectable pharmacutists from localities where no such associations exist; providing that all members shall subscribe to a code of ethics to be hereafter established; such a code to be applicable to the present condition of the profession, sufficiently stringent to elevate the members above many things now prevalent, and yet not so binding as to exclude a large number who, though well disposed, are unable to free themselves from participation in acts contrary to the highest standard, without a sacrifice greater than could be expected of them."

2. "The subject of pharmaceutical education is one of the greatest interest. An improvement of the standard of practice throughout the country cannot be effected without extending the present means of education, either by schools or by an increase of facili-

* The American Medical Association had been organized in Philadelphia in the year 1847.

† The Proceedings of the first conventions of the Association are now scarcely to be had. The several documents presented to the Association at its initial conventions reflect the condition of pharmacy and the difficulties and problems confronting the comparatively small array of accomplished pharmacists fifty years ago. Some of the most memorable reports and papers deserve to be perpetuated, and therefore are recorded in this brief historical retrospect, as they are an essential part of that portion of the proceedings of the Association with which the younger generation of pharmacists may be least familiar.

ties offered by proprietors to their apprentices and assistants. The voice of the Association should be raised to encourage the establishment of schools of pharmacy in suitable localities, and in connection with these, laboratories wherein advanced apprentices can have an opportunity to become familiar with the more difficult manipulations of pharmaceutical chemistry and of extemporaneous pharmacy, while in localities in which it is impracticable to establish schools of pharmacy, the organization of local associations and the foundation of pharmaceutical libraries should be encouraged and fostered, so that proprietors may have the opportunity to induce their assistants and apprentices to habits of self-study."

3. "The apprenticeship system should be taken into due consideration with the view to such uniformity and regulation as shall inure to the mutual advance of employer and employed. Proprietors should be induced to consider the fitness of the applicant, both as regards natural endowments and preliminary education, and should be held to their duty to teach and to give their employees opportunity to acquire a thorough knowledge of their profession."

4. "The subject of the inspection of important drugs, as regards the actual working of the law, is of deep interest to pharmacutists. The Association should lend its efforts toward the appointment and continuation in office of able drug inspectors, who should be appointed solely on the ground of fitness, and not, as is generally the case, removable on political grounds."

"The adulteration of drugs at home should be combated by inducing our State Legislatures and municipal authorities to authorize some form of inspection by which the delinquents can be reached, and the Association should urge with all the force of its influence, the enactment of State laws tending to a reformation of these evils."

5. "The more general adoption of our national Pharmacopœia as a guide in the preparation of officinal medicines is much to be desired."

6. "The indiscriminate sale of poisons by druggists and apothecaries is a serious evil. The Association should support any measures for abating the same."

7. "The subject of secret or quack medicines, together with the course usually followed by quacks in bringing their nostrums into notice, is becoming more and more fraught with ill consequences, both to the public and apothecaries, and calls forth the consideration of the Association whether any course can be suggested by which this great evil may be efficiently abated."

8. "The separation of pharmacy from the practice of medicine has long been effected on the continent of Europe. Inheriting, as we do, our medical institutions from Great Britain, the confusion of interests which has long prevailed there has in some measure descended to us, and many medical practitioners conduct apothecary shops among us. The increase of this class, in some localities, has been marked of late years, a fact attributable to the undue multiplication of graduates in medicine, who, finding the ranks of their profession so full as to render prospect of immediate success doubtful, turn towards pharmacy as a subsidiary means of support. As these mongrel apothecaries too frequently use their shops as stepping stones to business, they tend to depreciate the standard of practice, and tempt young apothecaries, who are struggling against the difficulties of an already excessive competition, to turn their attention to medical practice, with or without diploma; and thus complicate the confusion. As pharmacy never will advance as it should, whilst this amalgamation continues to exist, the Association should raise its voice against this growing evil."

9. "The annual meetings of the Association should be partially devoted to the advancement of pharmacy, as well as to the sciences upon which it is based, by inviting contributions of original papers, and by committing subjects requiring investigation to suitable committees, who should report the results of their researches at the ensuing

annual meeting, when, if they meet the approbation of the Association, they might be published in the annual proceedings." *

ESTABLISHMENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

At the second session, October 7th, 1852, this report was adopted, and permanent organization under the title "*American Pharmaceutical Association*" was effected by the adoption of a constitution, containing five sections, and of a code of ethics, consisting of six articles, for government and guidance. The original plan of having the membership of the Association constituted of delegates from colleges and societies only was dropped in favor of opening the doors of admittance to all respectable pharmacists and druggists.

The code of ethics considered and adopted at the same session of the convention is expressive of the broad and generous principles and aims which actuated the founders of the Association, and will forever remain a credit to them, and an interesting document in the history of American pharmacy.

"CODE OF ETHICS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION."

The American Pharmaceutical Association, composed of pharmacutists and druggists throughout the United States, feeling a strong interest in the success and advancement of their profession in its practical and scientific relations, and also impressed with the belief that no amount of knowledge and skill will protect themselves and the public from the ill effects of an undue competition, and the temptations to gain at the expense of quality, unless they are upheld by high moral obligations in the path of duty, have subscribed to the following code of ethics for the government of their personal conduct.

1. As the practice of pharmacy can only become uniform by an open and candid intercourse between the apothecaries and druggists among themselves and each other, by the adoption of the National Pharmacopœia as a guide in the preparation of officinal medicines, by the discountenance of secret formulæ and practices arising from a quackish spirit, and by an encouragement of that *esprit du corps* which will prevent a resort to those disreputable practices arising out of an injurious and wicked competition; therefore the members of this Association agree to uphold the use of the Pharmacopœia in their practice, to cultivate brotherly feeling among the members, and to discountenance quackery and dishonorable competition in their business.

2. As labor should have its just reward, the remuneration of the pharmacist's services should be in proportion to the skill, knowledge and responsibility required in his practice, rather than the market value of the preparation vended. A resort to intentional and unnecessary reduction in the rate of charges among apothecaries, with a view to gaining at the expense of their brethren, is strongly to be discountenanced by this Association.

3. After duly preparing himself for his profession, the apothecary has to rely on the good faith of the wholesale druggist in obtaining his supply of drugs and preparations. Those druggists whose knowledge, skill and integrity enable them to conduct their business faithfully, should be encouraged and sustained, rather than those who base their claims of patronage on the cheapness of their goods solely. All dishonest practices, such as the vending of inferior, deteriorated or adulterated drugs and preparations should be exposed for the benefit of the profession.

* Proceed. of the National Pharmaceutical Convention at Philadelphia, October, 1852, pp. 7 to 10.

4. As the practice of pharmacy and that of medicine are distinct professions, and as the conduction of the business of both professions by the same individual involves pecuniary temptations which are often not compatible with a conscientious discharge of duty, we consider that the members of this Association should discountenance all such professional amalgamation; and in conducting business at the counter, should avoid prescribing for diseases and refer applicants for medical advice to the physician. On the other hand, the practice of physicians in localities where good apothecaries are numerous, to supply medicines to their patients, is both unjust and unprofessional, as is the practice to allow a percentage or commission to physicians on their prescriptions.

5. The important influence exerted on the practice of pharmacy by the large proportion of physicians who have relinquished the dispensing of medicines to the apothecary, are reasons why he should seek their favorable opinion and cultivate the friendship of physicians by earnest endeavors to furnish their patients with pure and well prepared medicines. As physicians as well as apothecaries are liable to commit errors, any such in writing prescriptions, involving serious consequence to health and reputation if permitted to leave the shop, should be ameliorated by consulting the physician before proceeding in such a way as not to compromise the reputation of the physician. On the other hand, when apothecaries commit errors involving ill consequences, the physician should feel bound to screen them from undue censure, unless the error be the result of culpable negligence.

6. As we owe a debt of gratitude to our predecessors for the researches and observations which have so far advanced our scientific art, we hold that every apothecary and druggist is bound to contribute his mite towards the same fund, by noting the new ideas and phenomena which may occur in the course of his business, and publishing them when of sufficient consequence, for the benefit of the profession.*

Pursuant to inquiries addressed to the special examiners of drugs and chemicals at the principal Atlantic ports appointed in compliance with the drug law passed by Congress in the year 1846, the examiners of the ports of New York and Boston had furnished the convention with comprehensive reports and statistics which amply sustained the apprehensions which led to the convocation and organization of these pharmaceutical conventions.†

PERIOD OF ORGANIZATION.

The second annual meeting of the Association was held in Boston, August 24 to 26, 1853, twenty-seven members being present, and four Colleges of Pharmacy being represented. Mr. Wm. A. Brewer, of Boston, was elected President. The committee appointed at the initial meeting in the preceding year reported and offered valuable suggestions in regard to the problems deserving the prime consideration of the Association, among them the statistics of pharmacy in the United States; the condition of pharmaceutical education; the distribution of and use of the national pharmacopœia; the extent of the culture of indigenous medicinal plants; the indiscriminate trade in poisons, and the inefficiency of the respective statutes enacted in various States of the Union.

* Proceed. A. Ph. A., Vol. II (1853), pp. 45 to 46.

† Proceed. of the National Pharmac. Convention, held at Philadelphia, 1852, pp. 27 to 32.

Among other resolutions, the convention adopted the following one :

"The American Pharmaceutical Association, believing that the use and sale of secret or quack remedies is wrong in principle, and is in practice attended with injurious effects to both the profession and the public at large, earnestly recommends to pharmacists and druggists to discourage by every honorable means the use of nostrums; to refrain from recommending them to their customers, and from bringing them in any way to public notice; not to manufacture or to have manufactured any medicine the composition of which is not made public; and to use every opportunity of exposing the evils attending the use of secret medicines, and the false means employed to induce their consumption."*

In compliance with a resolution passed at the preceding convention for obtaining statistical and other pertinent information about the present condition of pharmacy throughout the country, interesting and instructive reports were rendered by colleges of pharmacy and by members of the Association from a number of States, reflecting the condition of pharmacy at the time of the origination of the American Pharmaceutical Association. These reports were in the main as follows :

The number of drug stores in *Massachusetts* in the year 1852 was, in thickly-settled districts, one store to about every 3,000 inhabitants; in towns of about 6,000 inhabitants, three stores; in cities of 10,000 and more inhabitants, one store to every 1,500 people. In villages and towns of less population than 3,000, the trade was divided between the practitioner of medicine and the general trader; in all places where the population is less than 6,000, the general traders who also sold drugs and medicines averaged eight to one apothecary.

In the States of *Maine*, *New Hampshire*, *Rhode Island* and *Connecticut* the number of drug stores kept by physicians surpassed those kept by apothecaries, and the stores of general dealers trading also in drugs and medicines far surpassed the number of legitimate drug stores. In all smaller places and in rural districts the physicians kept drug stores, or at least dispensed medicines.

Similar conditions prevailed in the State of *Pennsylvania*. The total number of druggists, exclusive of the city of Philadelphia, with 274 drug stores in the year 1852, amounted to 334. The sale of medicines by general store-keepers was common and extensive. Fifty-seven of the drug stores in Philadelphia were kept by physicians, who left them in the hands of medical apprentices or hired assistants. The competition among pharmacists in Philadelphia is so excessive as to be a chief obstacle to the attainment of a higher standard of knowledge and skill among them. There are retail stores in which the whole year's sales do not reach \$1,000, and in most of them the annual receipts range from \$1,500 to \$2,500.

* Similar resolutions have been passed on several occasions at subsequent meetings of the Association, and various measures have been proposed and endorsed for counteracting the presumed evil of the increasing nostrum trade, among them perhaps one of the most efficient ones, that of replacing the advertising annual almanacs of the nostrum manufacturers by a really useful and instructive almanac (*Popular Health Almanac*) for distribution by pharmacists. . (*The Chicago Pharmacist*, Vol. VII (1874), p. 321, and *Proc. A. Ph. A.*, Vol. XXIII (1875), p. 818.) But in course of time all these efforts have proved of no avail in discrediting and restricting the nostrum trade, at one time considered and condemned as an untoward gross abuse of medication. The last disapproval of the Association was expressed in a resolution passed at the convention in the White Mountains, July, 1892. (*Proc. A. Ph. A.*, Vol. XL (1892), p. 66.)

In *Ohio* the total number of drug stores was estimated at 534; of these, 91 in Cincinnati, 16 in Cleveland, 5 in Chillicothe, 10 in Dayton, 7 in Columbus, and 4 each in Zanesville and Steubenville.

The city of *New York* contained in May, 1852, 273 retail drug stores and 51 wholesale drug houses. An enactment to regulate the preparation and dispensing of medicines in the city of New York, passed by the Legislature of the State March 11, 1839, had proved unavailing and soon came into oblivion.

The State of *Virginia*, the one first provided with sanitary enactments, had in the year 1851, 110 regular drug stores, of these 22 in Richmond, 9 in Petersburg, 9 in Norfolk, and 8 each in Alexandria and Wheeling. In all the rural districts the physicians dispensed medicines.

The city of *Saint Louis*, Mo., had in the year 1852, 47 retail drug stores and 10 wholesale drug stores. Of these 24 of the former and 2 of the latter were kept by Germans. In all the drug stores and the stores of general dealers in Missouri nostrums are kept and are in general and increasing demand throughout the State.

In the State of *Indiana* the number of regular drug stores is small, only the larger towns have such. Physicians usually furnish their own medicines. Quackery is rife in the drug stores, as well as among physicians, not excepting those to be regular practitioners.

The State of *Maryland* contained in the year 1851 about 139 apothecary shops of all grades, about 100 of them in the city of Baltimore, but only about 12 were estimated as being owned by real apothecaries.

The *District of Columbia* had in the year 1851, 27 drug stores, 22 of them in the city of Washington and 5 in Georgetown.

In *North Carolina* there were only about 17 drug stores in the year 1851, of those 3 in Wilmington, 3 in Washington, and 3 in Raleigh. Throughout the State the dispensing and sale of medicines, inclusive of nostrums, was in the hands of the physicians.

In *Georgia* pharmacy was yet in its infancy, and pharmacists and physicians equally ignorant about materia medica in general. The use of nostrums was extensive.

In *New Orleans* there were 12 apothecaries' shops and 4 wholesale druggists, but many physicians dispensed and dealt in medicines and kept clerks.

The State of *Tennessee* had in the year 1852, 85 druggists, of these 13 in Nashville and 9 in Memphis. In the rural districts most of the country stores dealt also in drugs and medicines, and physicians dispensed medicines and many kept open stores. Nostrums were in common use.

Similar were the conditions prevailing in *Mississippi* and the other *Southern States*.*

The report from *California* stated that the State had an estimated population of 400,000 in the year 1852, and 77 regular drug stores; of these 30 are located in San Francisco, 19 in Sacramento, 5 in Marysville, 4 in Stockton, 3 in Placerville. Two-thirds of all the drug stores in California are kept by physicians. In the rural districts most practitioners dispense medicines and nostrums. The pharmacists in self-defense put into practice whatever medical knowledge they may possess, by treating the sick over the counter.†

These reports in general indicate in regard to professional knowledge and skill a very low status of the pharmacists and druggists, and the prevalence of empiricism and quackery among the physicians at the time before and at the organization and extension of local and national associations of medicine and pharmacy.

* Proceed. A. Ph. A., Vol. II (1853), pp. 24-42.

† Proceed. A. Ph. A., Vol. III (1854), p. 34.

The special drug examiner of the port of New York furnished an additional report supplementing the preceding one, that during the year 1852 large importations of the more important drugs had to be rejected on account of insufficient quality.*

The third annual meeting took place at Cincinnati, O., July 25 and 26, 1854; Mr. Wm. B. Chapman, of Cincinnati, was elected president. Of the reports read there were of special interest those of the committee appointed "to consider that part of the report of the committee on the inspection of drugs relating to fixing standards of quality for those drugs capable of it, together with the appropriate tests for detecting adulteration, when practicable."

In reference to the shortcomings of the drug law of the year 1846, mentioned on page 19, it may be stated that the Secretary of the Treasury, mainly on the initiative of the American Pharmaceutical Association at its first convention in 1852, had issued in the year 1853 a circular of instruction to the drug examiners fixing a standard of quality for a limited number of the more important drugs. This circular was supplemented by an additional report on "Standards of quality for the government of special examiners of drugs, etc.," and presented at the convention in Cincinnati in the year 1854.†

At this meeting the Association offered for the first time prizes as a stimulus to original research.‡

The most notable document submitted to the convention by Professor Wm. Procter, Jr., was the draft of "An address to the pharmacists of the United States" on the subject of the education of apprentices and assistants. This met with such appreciation that a resolution was passed to adopt the address in full and to have it reprinted in 3000 separate copies for general distribution. This remarkable address reads as follows:

Address to the Pharmacists of the United States. "The American Pharmaceutical Association, impressed with the importance of adopting some measure by which the present and future apothecaries of this country may be improved in educational standing and in the practice of their profession, have determined to address their brethren everywhere in our extended country, believing that some good results may arise from the hints they will suggest.

"By an inquiry extended to all sections of the Union, it has been ascertained that a vital defect exists in the very budding process of pharmaceutical education—the appren-

* The total amount of drugs of inferior quality rejected at the port of New York since the enforcement of the drug law of the year 1846 amounted, until August, 1853, to 710,000 pounds. (Proc. A. Ph. A., Vol. I (1852), p. 26, and Vol. II (1853), p. 42.)

† Proceed. A. Ph. A., Vol. III (1854), pp. 22-29.

‡ They consisted of the first twenty-three volumes of the American Journal of Pharmacy for the best essay on the commercial history of officinal drugs indigenous in the United States, and of six volumes of Gmelin's Handbook of Chemistry for the best essay on the question: Do hyoscyamus, belladonna and conium, grown in the United States, contain their active principles in the same proportions as the European plants?

ticeship. In many stores in the Atlantic cities north of Virginia, a system of apprenticeship exists, yet it rarely happens that a lad is legally indentured; the idea of such an instrument being exceedingly repulsive to most boys who aim at the apothecary business. In lieu of a legal indenture a feeling of honor-bound obligation should exist, equally binding on the part of apprentice and employer. For want of this tie between learners and employers, our country has been deluged with incompetent drug clerks, whose claim to the responsible position they hold or apply for, is based on a year or two's service in the shop, perhaps under circumstances illy calculated to increase their knowledge. These clerks in turn become principals, and have the direction of others.

"When we investigate the causes of this state of things, it will be found to arise primarily in the want of a correct feeling of the dignity and responsibility of the calling of the apothecary as a branch of the medical profession. The larger number of those who deal in drugs and medicines do so solely to make money; they aim at making the most of the least outlay of capital and trouble. To *sell* medicines is their vocation; and he is the best clerk who can sell the *most*, under whatever circumstances it is effected. To avoid the necessity of gaining the requisite knowledge of practical pharmacy, it is no uncommon habit to buy all preparations ready-made, except the simpler ones, and that at the lowest price. The business, thus shorn of its most interesting department, the application of chemical knowledge to the conversion of crude drugs into medicines, becomes a mere store keeping, where apprentice and clerk are kept putting up and selling parcels and ready-made medicines, the preparation of which, and the beautiful reactions often concerned in their manufacture, they remain as complete a stranger to as though they did not exist. Is it any wonder then, that after one or two years' service, the apprentice should fancy that he had learned the business as a seller of drugs and medicines, and becoming uneasy at the prospect of a four years' term of apprenticeship, start out as a full-fledged drug clerk?

"In purchasing all pharmaceuticals ready-made the pharmacist forgets the injustice thus done to his apprentice and clerk, who becomes thus deprived of the important practical knowledge only to be gained by becoming familiar with the manipulations which their preparation involves. Having abandoned, to a large extent, the making of these preparations, such apothecaries are too apt to accept the agency of the numerous quackeries that abound to swell their sales, and from this are led into the origination of nostrums and become quacks themselves. They are further induced to trench on the business of the tobacconist, the candy-dealer, the stationer and the variety store keeper by keeping their wares.

"So long as this abandonment of the legitimate duties of the pharmacist remains, it is hopeless to expect that apprentices will feel that interest in the business they have embarked in that is excited when they are called upon to carry out the various chemical and pharmaceutical processes that properly should be performed in every well conducted apothecary shop.

"Familiarity with those processes in which the phenomena of mechanical division, solution, extraction, distillation and other operations are practically studied, is a true basis upon which to build the knowledge required by a skilful pharmacist and prescriber, whose vocation includes the highest department of the art of pharmacy. It is indeed the only basis upon which it should repose. Making the officinal preparations is, therefore, an indispensable part of pharmaceutical education, and no apothecary, whose scheme of business does not include the preparation of at least a considerable portion of them, can efficiently educate those under his care.

"Correspondence of this Committee with apothecaries has placed the Association in possession of many facts bearing on the condition of pharmacy and pharmaceutical education within the United States. It appears that the tenure of apprenticeship has become so lax that as a general rule very little dependence is placed upon it. Boys are taken at

a venture, the employer making the best bargain he can, feeling assured that the boy will leave or demand clerk's wages before he has been with him half a regular term. From this course, it is stated, the number of half educated assistants is large, and presents a serious difficulty in the prosecution of business in the way it should be conducted. As the result of this condition of things, it has been found that there are three classes of individuals engaged in pharmaceutical pursuits who claim the interest of the Association, and to whom particularly this address is directed, viz.: 1st. Those who are imperfectly acquainted with pharmacy and are in business for themselves; 2d. Those who have been but half educated as apprentices, and who are now assistants receiving salaries, having the responsibility of business entrusted to them; 3d. Those who are now apprentices or beginners under circumstances and with ideas unfavorable to the requirement of a thorough knowledge of the drug and apothecaries' business.

"After a young man has commenced business, he rarely feels disposed or thinks he has time for systematic study, and is apt to discard all attempts at it, depending on occasional references to books. This is a grave mistake. Let the young proprietor who feels his deficiency make it a rule before making each preparation to consult authoritative books, and afterwards note the correspondence or difference of his results with those laid down. This will tend to detect and correct errors, and will soon give a constant habit of observation of practical value, and will gradually excite an interest in the collateral branches of science that, if pursued, will place him on the high road to professional proficiency.

"The young proprietor should keep and dispense only good drugs and medicines. He will aid his success by storing his memory with general information useful to his patrons, and render himself as necessary to the comfort as he is to the health of his neighborhood by his willingness to give it out.

"On the legitimate apothecary depends the progress of pharmacy; remembering his own imperfect opportunities, he should give to his apprentices the best tuition he is capable of. It is a mistaken and short-sighted policy to withhold instruction beyond the merest calls of business, under the impression that it may react unfavorably to his interest. To this end he should improve and extend his pharmaceutical library, encourage the periodical literature of pharmacy to keep posted up with the improvements and discoveries of the day, and he should exhibit such an interest in his apprentices and assistants as will encourage them to adopt a habit of study, which is the best safeguard against the temptations of youth, unless they have some regular object of pursuit.

"The second class, or assistants but half educated, are found everywhere, because the causes of their deficiencies exist everywhere. The assistant has in general ample opportunities for study; he should not fail to embrace them at every occasion. He should beware of the idea that he 'knows enough to conduct business.' In offering himself as a pharmaceutical assistant, a young man tacitly declares that he is capable of conducting a dispensing establishment. He assumes a responsible position, next only to that of his employer. In the eye of the law he is responsible, in the absence of his employer, for the conduct of business, and is actionable for the results of his own ignorance and carelessness. A proper sense of this should induce the assistant to qualify himself by study.

"The third class, the beginners or apprentices, call forth the earnest sympathy of the Association. It depends much on the employer whether the apprentice will make rapid or slow progress, or whether he will ever make a good apothecary, but more rests with himself. Some dispositions are so inimical to tuition that no amount of pains will fashion them into shape, whilst it often happens that a promising youth will grow into irregularities from the want of a little training on the part of the employer. If there is any one fault in American boys more prominent than another, it is the inclination to act independently of authority. The 'Young America' spirit leads to various ill results, one of the chief of which is imperfect education, whether professional, mercantile or mechanical. It is one phase of this ill spirit that is now filling the ranks of pharmacy with half-

educated clerks. The beginner should early comprehend that his vocation consists of something more than a business for gaining a livelihood; it also partakes of the character of a liberal profession, and demands of its votaries that they uphold its ethics even at a sacrifice of gain. It would be well if every beginner could have a vision of the duties he has to perform before entering the precincts of the shop as an apprentice. This vista would discourage all but the earnest ones who, seeing beyond present inconveniences, aim at the highest qualification. To these the apothecary's store, with all its petty details and trials, its busy as well as tedious days and long hours of work, affords a field wide in the produce it yields to the unremitting exertions of the earnest student.

"The difficulties in the way of sustaining schools of pharmacy will confine them to large cities, where the number of students and the accessories to study are numerous. Slow but regular currents will circulate between these and distant towns and country districts, and their graduates, in seeking spheres of action, will carry back with them the principles they imbibe and thus act as inducing examples to their less favored brethren. The vast importance, therefore, of good schools of pharmacy is so evident that this Association freely extends its countenance and encouragement to those already existing, and to all new efforts, claiming for them the patronage they deserve.

"Such are some of the more prominent points at issue in the educational reform so much needed in the pharmaceutical body of the United States. If the incubus of quackery were removed, a general feeling of the necessity of better means of pharmaceutical education existed, and a strong chain of associations linked together by fraternal feeling established, the prospects of American pharmacy would be flattering indeed. The most sanguine believers in progress do not expect a sudden reformation; but there are many who look with all interest and strong faith to the silent influence of a better education in working a change among the individuals of the profession." *

The fourth annual meeting was held in New York in September, 1855. The Colleges of Pharmacy of Boston, New York, Philadelphia, Baltimore and Cincinnati were represented by delegates. Mr. John Meakim, of New York, was elected president. The Constitution of the Association, adopted in the year 1852, was somewhat amended in regard to the admission to membership. A brief report of the committee on standards for drugs was rendered, calling attention to the insufficiency of the statutes now in force. For the first time two original essays were presented, one by Edward S. Wayne, of Cincinnati, on the growth and production of wines and argols in the Ohio Valley, the other by Alphaeus Sharp, of Baltimore, on the strength of commercial hydrochloric and nitric acids. A resolution was passed at this meeting that the Association henceforth decline any convivial or other entertainment as offered by the local pharmacists at the preceding conventions. Such futile resolutions have repeatedly been passed in subsequent years. For the first time an exhibit of apparatus, glass-ware, and specimens of drugs, chemicals, etc., was connected with the meeting.

The proceedings of the further more or less initial conventions of the Association may be summarized by briefly mentioning their more important actions. In general, the first ten years of the Association may be

* Proceed. A. Ph. A., Vol. III (1854), pp. 14-22.

considered a period of organization and consolidation, reaching to more settled conditions in its functions and the general status of the profession. As did the initial, so do the subsequent meetings bear ample evidence of the unselfish and sterling motives of the founders and early members of the Association, and of their earnest efforts towards effecting the requirements paramount for the realization of their prime aims in regard to the improvement of the drug market, to stricter discrimination in the admittance of beginners to the ranks of pharmacy, to better training and education of apprentices, and to the establishment of new and the encouragement of the existing schools of pharmacy and local associations as educational centres.

The subsequent annual conventions were marked by increasing attendance, membership and activity. At the meeting in Baltimore in the year 1856, the organization of the Association was further perfected by amendments to the Constitution which much increased its scope and usefulness. The prize queries offered at the meeting in the year 1854, having received no response, were henceforth made a regular feature at each annual convention, to be reported upon at the next one; nineteen new queries for general acceptance were added, fifteen of which were accepted by members present at the meeting. The propriety of this measure manifested itself at the subsequent meeting, when nine papers were received in response to the queries, and besides five volunteer papers. A further progressive action at this convention was the election of committees for the elaboration of an annual report on the progress of pharmacy, on the revision of the Pharmacopœia, on weights and measures, on unofficial formulæ, on suitable text-books for the study of pharmacy, and for offering a proper syllabus for pharmaceutical students.

In consequence, the convention in Philadelphia, in the year 1857, excelled by a number of good reports and papers, among them the first report on the progress of pharmacy, by Prof. Wm. Procter, Jr., and a report on the expediency of the Association taking part in the revision of the Pharmacopœia, and reports on unofficial formulæ, on weights and measures, on the sale of poisons, and on home adulteration. The report on the progress of pharmacy, the first one of the long series of subsequent but more comprehensive annual reports, was a diminutive one, covering only twenty-nine pages of the Proceedings. Other interesting papers presented at this meeting were: on The Manufacture of Iodine from the Ashes of Sea-weeds, by Thos. D. Porteus;* on American Ergot, by Wm. Procter, Jr.;† on Henbane of American Growth, by Fred. Stearns;‡ on New England Isinglass, by C. T. Carney;§ on Methods of Rendering Medicines Pleasing and Agreeable, by Fred. Stearns;|| on Spigelia, by

* Proceed. A. Ph. A., Vol. VI (1857), p. 110.

† *Ibid.*, p. 127.

‡ *Ibid.*, p. 121.

§ *Ibid.*, p. 105.

|| *Ibid.*, p. 134.

R. H. Stabler; * on The Use of Indigenous Plants, being the first contribution from Prof. John M. Maisch.†

At the meetings in the years 1857 and 1858 amendments to the drug law for stricter vigilance in its execution, particularly in regard to condemned drugs, and for the appointment of competent and efficient drug examiners were proposed and adopted, and likewise a resolution to memorialize the Secretary of the Treasury and Congress for a revision and amendment of the drug law of the year 1846. Special attention was called to the importance of the appointments under the law, stating that these offices are entirely of a scientific character and therefore should not be made, nor competent drug examiners be removed, solely on political grounds. The petition concluded with a protest in the name of the Association, against the prostitution of this wise and salutary law to the mere purposes of political partisanship.‡

The reports of committees on the adulteration of drugs presented at the annual conventions in the years 1855 and 1860 evinced the fact that the sophistication of drugs, particularly of powdered drugs and spices, prevailed to an alarming extent. It was suggested that the evil might be remedied by appropriate legislation. But no efficient efforts seem to have been made at the time, and the chairman of the respective committees stated in his notable report on the home adulteration of drugs at the meeting in the year 1858 that in the opinion of the committee, the Association had to look to an elevation of the professional standard rather than to legislative prohibition of the evil.§

The annual conventions in the years 1858, 1859 and 1860 showed a marked activity and increase of interest in the Association by the addition of new members, and by more elaborate reports and a greater number of valuable papers. Among these were the reports on the progress of pharmacy, on home adulteration of drugs by C. B. Guthrie,|| on a syllabus of a course of study, intended as an aid to students of pharmacy, by Wm. Procter, Jr.,¶ on the revision of the Pharmacopœia,** the notable paper on percolation by Israel J. Grahame,†† an elaborate report on weights and measures by Alfred B. Taylor,‡‡ suggestions upon some of the processes of the United States Pharmacopœia (the first contribution by Edward R. Squibb),§§ on the medicinal plants and the peppermint plantations of

* Proceed. A. Ph. A., Vol. VI (1857), p. 132.

† *Ibid.*, p. 153.

‡ Proceed. A. Ph. A., Vol. VI (1857), p. 24; Vol. VII (1858), p. 234.

§ Vol. VII (1858), p. 228.

|| p. 222.

¶ p. 103.

** Vol. VI (1857), p. 21; Vol. VII (1858), pp. 177-221; Vol. VIII (1859), pp. 217-245.

†† Vol. VII (1858), p. 285.

‡‡ Proceed. A. Ph. A., Vol. VIII (1859), pp. 115-216.

§§ *Ibid.*, Vol. VII (1858), p. 386.

Michigan, by Fred. Stearns,* on patents in relation to pharmacy, by Edward Parrish.†

At the meetings in the years 1856, 1857, 1860 and 1868 efforts were made for having the Association incorporated ; this was not realized, however, before the year 1888.

FURTHER CONSOLIDATION AND DEVELOPMENT OF THE ASSOCIATION.

When stirring events and untoward discord, in the years 1859 and 1860, ushered in the Civil War, public interest centered in the subsequent ruthless sectional strife and combat of arms. Associate relations and affairs were submerged in the national commotion. At this trying time, however, the Association had attained to a prime maturity in its organization, institutions and functions. Its consolidation and integrity were assured, and proved of such strength and worth that the Association endured and survived unimpaired the reverses and storms of threatened national disruption. The annual convention in the year 1861 was the only one missed, and although peace was not restored before the year 1865, the regular annual meeting of the year 1862 was held in Philadelphia.

The Association has ever since proceeded along the well-defined lines designed by the wisdom and exertion of its founders, holding its conventions with increasing attendance and activity year after year as milestones of the successive advance of American pharmacy. Every decade of its onward march has given added worth and importance to this national union, binding common aims, interests and accomplishments together and co-ordinating them for the common good. In all the fluctuations and reverses of half a century, and in the professional expansion in general and the increasing specialization in details, the American Pharmaceutical Association has remained steadfast and persistent as a promoter and custodian of all that is substantial and conducive to the furtherance of the prosperity, the ethical status, the integrity and advance of legitimate pharmacy as a co-ordinate factor of the healing and sanitary arts.

The annual conventions of the Association were attended, at its initial meetings, in 1852 by 21, in 1853 by 28, and in 1860 by 111 members, the number of attendants varying considerably, according to the location of the meeting places and their distance from the Atlantic States. The maximum attendance thus far was reached in the Centennial year, 1876, in Philadelphia, with a presence of 372 members ; at the meeting held during the World's Fair, in Chicago, Ill., in 1893, there were 286, and in the year 1901, in St. Louis, Mo., 201 delegates and members in attendance.

The Association has met in most sections of the country, from Boston and Old Point Comfort in the East to Denver and San Francisco in the

* Proceed. A. Ph. A., Vol. VII (1858), pp. 336 and 449.

† *Ibid.*, Vol. IX (1860), p. 173.

West, and from Montreal, Toronto and Lake Minnetonka in the North to Atlanta and New Orleans in the South.

The Association was wisely planned at its inception and has been founded on the basis of a suitable and approved constitution. The administration of its business affairs has been throughout in the hands of men of sterling worth, who have conducted them on firmly established principles and with signal ability. The usual officers for conducting the convention and the business of the Association were at first supported by an executive committee. With the growth of the Association it became necessary to relieve the meetings as much as possible of the increasing amount of frequently trivial business matters and pertinent discussions. In the year 1880 a Council, consisting of several members, was annually elected in place of the former executive and business committees, who, with the permanent secretary, transacted the affairs of the Association at the meetings as well as in the intervals between these. To bring reports, papers and discourses in a more systematic order before the conventions, a further improvement was made, at the meeting in the year 1887, by instituting three special Sections, one for scientific papers and discussions, another for pharmaceutical education and legislation, and the third one for commercial interests, in this way dividing the time and transactions of the annual meetings between the general business sessions and those of these three Sections.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The founders of the Association wisely devised the means and best method for having the proceedings of the annual conventions, including reports and papers, properly published in book form. These "*Proceedings of the American Pharmaceutical Association*" have ever since its organization been continued. The initial issues formed only pamphlets, the issue in the year 1852 comprising 32, in 1853, 48, in 1854 and 1855, each 40 pages. Commensurate with the increase of the Association in membership, importance and influence, and the amount of transactions, reports and papers presented, these annual publications have been amplified in contents and volume from year to year, extending already in 1858 to 488 pages, and reaching a maximum in 1894 with 1394 pages.

The 49 volumes of the Proceedings contain, in addition to the reports and papers presented and the discussions at the annual meetings, a multitude of valuable and useful original essays and discourses covering the scope of the science and practice of pharmacy and its educational, legislative and trade concerns and interests. In addition to the annual reports on the progress of pharmacy they, therefore, represent a comprehensive repository of the thought, researches and work of the foremost talent in American pharmacy, and of the professional accomplishments and progress in general during the last half of the 19th century.

The Proceedings contain among the great number of original contributions many which now are of historical interest. Among these but a few may be recalled here; they are specially the first publication of the still-used alkaloidal test of Ferd. F. Mayer,* the initial studies on fluid extracts and their preparation by percolation, by Israel J. Grahame,† Edward R. Squibb,‡ Wm. Procter, Jr.,§ John U. Lloyd,|| C. L. Diehl,¶ and others; A. B. Prescott's morphimetric process;** MacLagan's modification of Kerner's quinine test;†† the historical paper of Daniel Hanbury on exports from Virginia in the year 1610;‡‡ Henry S. Wellcome's visit to the native cinchona forests of South America,§§ and in more recent years, in part, the elaborate researches on alkaloids by A. B. Prescott, and on terpenes and the constituents of American volatile oils, by Fred. B. Power, Edward Kremers, and their assistants.

In common with the contemporary pharmaceutical periodical literature, the Proceedings, furthermore, reveal the extent to which the abstractly scientific research work, including standardization and physiological tests, in recent time, has been shifted from the province of the pharmacist to the research laboratories of manufacturing establishments, of universities and colleges of pharmacy, and into the hands of men of superior academic or college training and experience. With the rapid advance in the exactitude of scientific methods, in the expansion of the chemical, pharmacognostical and botanical sciences, and in the improvement of the implements of research, it is but natural that the strictly scientific work should become more and more confined to the specially trained modern chemist, botanist and bacteriologist, not unfrequently emanating from the ranks of medicine and pharmacy, while the pharmacist's domain of scientific application has been reduced mainly to the identification and examination of pharmaceutical products and of drugs and chemicals.

This mutation and specialization is the cogent result of the advance and evolution of applied science and of industrial and manufacturing progress

* Proceed. A. Ph. A., Vol. X (1862), p. 238.

† Vol. VII (1858), p. 285.

‡ Vol. XIII (1865), p. 201; Vol. XV (1867), p. 391; Vol. XVIII (1870), pp. 161, 180; Vol. XX (1872), p. 182; Vol. XXVI (1878), p. 708.

§ Proceed. A. Ph. A., Vol. VIII (1859), pp. 265-279; Vol. XI (1863), p. 222.

|| Vol. XXVII (1879), p. 682; Vol. XXIX (1881), p. 408; Vol. XXX (1882), p. 509; Vol. XXXI (1883), p. 336; Vol. XXXII (1884), p. 410; Vol. XXXIII (1885), p. 411; Vol. XXXIX (1891), p. 128.

¶ Vol. XXVI (1878), p. 681; Vol. XXVII (1879), p. 727; Vol. XXVIII (1880), p. 424.

** Vol. XXVI (1878), p. 807.

†† Vol. XXXII (1884), p. 461.

‡‡ Vol. XIX (1871), p. 491.

§§ Vol. XXVII (1879), p. 814.

in general. This in some respect untoward change has become more and more manifest in pharmacy, and has gradually asserted itself in Europe as well as in the United States.

The editing of the first ten volumes of the Proceedings, from 1852 to 1863, was accomplished by the Chairman of the annually elected Executive Committee. In the year 1864, Prof. John M. Maisch was elected Chairman of this Committee, and in 1865 to the newly created office of "Permanent Recording Secretary" of the Association, so that the editing of the Proceedings was in his hands for a period of 28 years, from 1865 to the time of his death in the year 1893. The volume of the year 1893 was edited by Prof. Joseph P. Remington, and since then the newly appointed "General Secretary," Prof. Charles Caspari, Jr., has been the editor.

ANNUAL REPORT ON THE PROGRESS OF PHARMACY.

One of the most valuable, useful and creditable features of the Proceedings, as well as of the functions of the Association, has been the presentation of an annual report on the general progress of pharmacy, commenced in the year 1856.* The first reports were compiled for the years 1855, 1856 and 1859 by Wm. Procter, Jr.; in 1858 by Fred. Stearns; in 1860 by Edward Parrish; in 1862 by John M. Maisch. While the report had thus far been arranged under arbitrary general headings, Prof. Maisch introduced a better systematic grouping of the subject matter, which, with suitable modifications, has ever since been retained in all subsequent reports. In recent years they have grown much in volume and comprehensiveness.†

Until the year 1873, these reports were made by the chairman of an annually elected committee on the progress of pharmacy. In 1873 this committee was discontinued and a special reporter elected.‡ The reports

* Such annual reports on the progress of pharmacy were first issued in the year 1841, in Germany, in connection with "Cannstatt's Jahresbericht der gesamten Medicin in allen Ländern," by the additional publication of "Jahresberichte der gesamten Pharmacie und Pharmacologie," by Diesbach, Martius and Wiggers. With a change of title, editors and collaborators, these reports have ever since been continued, and appear since the year 1891 as "Jahresberichte der Pharmacie," under the auspices of the German Apothecaries' Association, edited by Prof. Beckurts.

The corresponding British publication, by the British Pharmaceutical Conference, the "Year-Book of Pharmacy," appears since the year 1864.

† In consideration of the rapid growth of the vast amount of material both scientific and practical produced annually in the various branches of pharmacy, and of the constant extent and multiplication of the periodical literature in the various countries and languages, attention has been called at several opportunities to the advantages of apportioning the elaboration of these comprehensive annual reports to more than one reporter. (Proceed. A. Ph. A., Vol. XVII (1869), pp. 87, 282; Vol. XX (1872). p. 41.)

‡ Proceed. A. Ph. A., Vol. XXI (1873), pp. 35-38.

were compiled, in the years 1863 to 1872—by Ferd. F. Mayer in 1863, by G. J. Scattergood in 1864, by J. Faris Moore in 1865, by Enno Sander in 1866, by C. L. Diehl in 1867, by F. Mahla in 1868, by Fr. Hoffmann in 1869, by Wm. T. Wenzell in 1870, by Th. E. Jenkins in 1871; from 1872 to 1891 they were prepared by C. L. Diehl; in 1892 by H. M. Wilder, under the direction of Chas. Rice, and in 1893 and 1894 by Henry Kraemer. Since the year 1895 Prof. C. L. Diehl has again acted as reporter on the progress of pharmacy, having accomplished this exacting work for twenty-eight years.

PHARMACEUTICAL LEGISLATION.

The problem of requisite and suitable legislation for the practice of pharmacy, including a control of the qualification and proficiency of its personnel by means of State or Local Boards of Pharmacy, the sale of poisons, the responsibility of proprietors and assistants, etc., has engaged the interest and action of the Association from the beginning, and was one of the prime objects of its organization. Since the year 1862 standing committees on legislation have been in regular order from year to year, and the successive reports, resolutions and drafts for proposed enactments, urging upon the legislatures their imperative necessity in the interest of the public weal and the profession at large, are to be found in almost every volume of the Proceedings of the Association since the year 1853.*

The committee appointed at the fifteenth annual meeting, in the year 1867, to offer to the legislatures and constitutional conventions of the various States the services of the Association in regard to a legal control of the practice of pharmacy, rendered a comprehensive report at the subsequent meeting, in the year 1868,† and submitted in 1869 a "Pro Memoria" and a draft of a law for regulating the practice of pharmacy and the sale of poisons, and of preventing the adulteration of drugs and medicines.‡ This elaborate draft was carefully discussed and in several points amended, and it was resolved that the report and the amended draft of a law, together with the discussions and resolutions, be printed in pamphlet form, and that ten copies each be sent to the governors and the speakers of the legislatures of every State.

This draft has served as a prototype of most or all subsequent pharmacy laws since enacted. With altered conditions, it became, however, in time

* The earliest enactments for a legal regulation of the practice of pharmacy and of the sale of poisons on record seem to be those for the City of New York in the year 1839, and for the States of Michigan in 1846, New Hampshire in 1851, Ohio and Pennsylvania both in 1852, and Illinois in 1853. (Proceed. A. Ph. A., Vol. XVI (1868), pp. 329-370.)

† Proceed. A. Ph. A., Vol. XVI (1868), p. 329.

‡ Vol. XVII (1869), pp. 51, 83.

necessary to amend the existing laws so as to adapt them to modern requirements and conditions. At the meeting of the Association in the year 1899 a committee was appointed for framing a model law to which the laws existing in most states may in time be made to conform. The committee presented at the subsequent convention in the year 1900 a draft of a general form of pharmacy law suitable for enactment by the state legislatures. The draft was somewhat amended and adopted, and a resolution passed to have reprints of the same made in pamphlet form with suitable explanatory notes, and to send copies to all the state boards of pharmacy and to recommend the use of this "model law" as a basis for further amendments and improvement of the existing laws.*

When the abundance of corresponding laws enacted and re-enacted in most states of the Union in the course of recent years has failed to fully and permanently realize the desired objects, the shortcomings have been chiefly due to misleading or inconsistent measures and prevailing methods of both legislative and administrative empiricism and laxness.

THE PHARMACOPŒIA AND THE NATIONAL FORMULARY.

As stated on page 16, due consideration has been devoted by the Association to the periodical revision of the United States Pharmacopœia. A committee was appointed in the year 1856 for considering and reporting on the expediency of the associations participating in the work of the decennial revision. Such committees have been continued ever since, and in their annual reports have been instrumental in the progressive participation of pharmacists in revising and perfecting the Pharmacopœia. The committee was made a permanent one in the year 1863,† and was added to a group of sectional committees instituted in the year 1887.

In this connection, the Association has made strenuous efforts since the years 1857 and 1860 to collect and present through special committees approved formulæ for so-called unofficial pharmaceutical preparations, in order to counteract and repress the increasing multiplication and use of all sorts of specialties and proprietaries. A number of reports and compilations of such formulæ are recorded in the successive volumes of the Proceedings, the first one in the year 1857,‡ and a notable one on elixirs in 1873.§ These efforts of the Association, shared by some local associations, finally resulted in the publication of the "National Formulary of Unofficial Preparations" in the Proceedings of the year 1888.||

* Vol. XLVIII (1900), p. 309-318.

† Proceed. A. Ph. A., Vol. XI (1863), p. 42.

‡ Vol. VI (1857), p. 79.

§ Vol. XXI (1873), p. 119.

|| A second revised edition, eliminating such preparations as meanwhile had become official in the seventh edition of the Pharmacopœia of the year 1890, and expressing weights and measures in metric units, was issued in the Proceedings, as well as in a separate reprint in the year 1895.

ADOPTION OF METRIC UNITS.

The subject of metric units in place of the arbitrary weights and measures still in use in the United States had early engaged the interest and action of the Association; since the year 1857 special committees have been elected, valuable reports received and resolutions adopted, in common with other scientific associations, for petitioning Congress to adopt and introduce metric standards throughout, as used in almost all countries except the United States and the British Empire. While these efforts in general have not yet attained to a full realization, they led at least to the adoption of the metric system in the Pharmacopœia of the year 1890, and of metric units exclusively in the forthcoming eighth decennial revision of the year 1900.

PHARMACEUTICAL EDUCATION.

The cause and the problems of pharmaceutical education have early and constantly engaged the attention and care of the founders and the members of the Association, the organization of which fell into the years of the early struggles for existence of the first established colleges of pharmacy. The Proceedings as well as the contemporaneous pharmaceutical periodicals bear ample evidence to how largely and ably the foremost minds of the Association and the profession at all times and in all exigencies have contributed their share of advisory and instructive essays, discourses and suggestions in Association conventions and in the press.*

* Some of the more important and noteworthy papers by well-known authors may be recalled here for ready reference: *Americ. Pharmac. Association*, Proceed. A. Ph. A., Vol. XXXVII (1889), p. 281; Vol. XLII (1894), p. 353. *Americ. Journal of Pharmacy*, Vol. VI (1834), p. 279; Vol. XXVI (1854), p. 388; Vol. XXXVIII (1866), pp. 187, 479; Vol. XLII (1870), pp. 281, 377, 500, 556; Vol. LIII (1881), p. 524; Vol. LIV (1882), p. 477. *E. S. Bastin*, Proc. A. Ph. A., Vol. XXXVI (1888), p. 186. *Pharm. Rundschau*, Vol. VI (1888), p. 283. *S. M. Colcord*, Proc. A. Ph. A., Vol. XIX (1871), p. 418. *Charles O. Curtman*, *Pharm. Rundschau*, Vol. VI (1888), p. 158. *James M. Good*, Proc. A. Ph. A., Vol. XLIII (1895), pp. 342, 413. *Fr. Hoffmann*, *Pharm. Rund.*, Vol. I (1883), p. 257; Vol. III (1885), p. 71; Vol. IV (1886), p. 95; Vol. VII (1889), pp. 54, 205; Vol. XIII (1895), pp. 75, 125. *Ed. Kremers*, Proc. A. Ph. A., Vol. XL (1892), p. 309; Vol. XLII (1894), p. 399; Vol. XLIII (1895), p. 447; *Pharm. Rund.*, Vol. X (1892), p. 187; Vol. XII (1894), p. 229; Vol. XIII (1895), p. 205. *J. U. Lloyd*, Proc. A. Ph. A., Vol. XXXVI (1888), p. 6. *John M. Maisch*, *Pharm. Rund.*, Vol. I (1883), p. 182. *O. Oldberg*, Proc. A. Ph. A., Vol. XLII (1894), p. 429. *Edw. Parrish*, Proc. A. Ph. A., Vol. XII (1864), p. 273; Vol. XIV (1866), p. 39; Vol. XX (1872), p. 173. *Fr. B. Power*, *Pharm. Rund.*, Vol. III (1885), p. 118; Vol. VI (1888), p. 279; Vol. XI (1893), p. 258. *A. B. Prescott*, Proc. A. Ph. A., Vol. XIX (1871), p. 425; *Pharm. Rund.*, Vol. XIII (1895), p. 176. *Wm. Procter, Jr.*, Proc. A. Ph. A., Vol. III (1854), p. 14; Vol. VII (1858), p. 103; Vol. XXI (1873), p. 523. *L. E. Sayre*, Proc. A. Ph. A., Vol. XXXVI (1888), p. 180; Vol. XLII (1894), p. 421. *Wm. Simon*, *Pharm. Rund.*, Vol. VII (1889), pp. 8, 65; Proc. A. Ph. A., Vol. XL (1892), p. 299. *A. B. Stevens*, Proc. A. Ph. A., Vol. XL (1892), p. 296. *W. L. Turner*, *Pharm. Rund.*, Vol. VII (1889), p. 239.

Criticism and restriction, however, were called forth now and then in the course of years by the unnecessary experimental and speculative multiplication of colleges and schools of pharmacy.

In order to check or remedy shortcomings, and to attain to more uniform and systematic methods throughout in the various colleges, it was proposed and adopted at the convention of the Association held in Baltimore in the year 1870 to hold, in connection with the annual meetings, conferences of the teaching colleges of pharmacy for the purpose of coming to a common understanding in regard to the qualifications of candidates to be admitted to the college courses and to the requirements at the final examinations for graduation, and to agree upon an approximate unification of the courses and methods of theoretical and practical instruction. These conferences were held until the year 1882, but afterwards discontinued because they proved unavailing,* particularly when schools of pharmacy of various grades, sometimes mere business ventures, came into existence.†

In the course of recent years, as mentioned on pages 12 and 13, a great deal has been accomplished for the elimination of the traditional empiricism and for the general elevation of the status of legitimate pharmacy by better training of the beginners, and much progress has been made since the organization and by the efforts of the American Pharmaceutical Association towards the solution of the never-ending problem of the professional education of the pharmacists in conformity with modern progress and requirements; but in view of the prevailing ill-advised tendency towards the excessive multiplication of all grades and kinds of schools and institutions of pharmacy, and the latitude left them in arbitrary appointments and in the choice of expedients and schemes for success, there remains cause for apprehension as to maintaining unimpaired the established standards and the integrity of pharmaceutical education.‡

* Prof. Maisch, in *Pharmac. Rundschau*, Vol. I (1883), p. 182; Vol. VII (1889), p. 207.

† In 1899 a movement was started to organize a new association of the faculties of the colleges of pharmacy for the purpose of promoting the interest of pharmaceutical education and to bring about greater uniformity in the requirements for admission and for examination, as well as in the methods and the extent of theoretical and practical instruction. Organization was effected at Richmond, Va., May 9, 1900, and the association, which is known as the American Conference of Pharmaceutical Faculties, held its second annual meeting at St. Louis, Mo., September 19, 1901.

‡ The most serious drawback from which pharmaceutical education in our country has always suffered is the unrestricted low standard of the preliminary education of most young men entering the drug trade. This lowers all subsequent standards, and as long as it is allowed to continue, defeats all efforts for general solid advance. Therefore, the paramount prerequisite for raising the professional status of American pharmacy generally and efficiently upon a higher and more uniform plane of proficiency and public appreciation unquestionably consists in the expedient of barring the doors of entrance

PHARMACEUTICAL DEGREES.

The choice of titles to be conferred upon graduates of colleges and schools of pharmacy has received the consideration and action of the Association on several occasions. It will be remembered that the establishment of the first college of pharmacy was due largely to the opposition of pharmacists to an effort of an American university to offer, upon the substratum of a several years' apprenticeship in the store, a collegiate education to pharmacists, and to confer upon those passing the examination through its medical faculty, the title of "Master of Pharmacy." Preferring and establishing the designation of "Graduate in Pharmacy," the same college and its earlier eminent members* have on several occasions in subsequent years, by themselves and in common with the American Pharmaceutical Association, raised their voice in protest against the arbitrary adoption of academic degrees for graduates or post-graduates of colleges of pharmacy, and the Association has at various times discountenanced any such usurpation of questionable titles,† as has also been done by well known American writers and educators.‡ §

RELATIONS OF THE PHARMACEUTICAL STATE ASSOCIATIONS TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

In consequence of the rapid increase of the population, of agriculture commerce, industries and wealth, the number of drug stores had correspondingly multiplied all the time. The majority of men starting new stores, particularly in country districts, were non-graduates who, perhaps upon a brief and varied experience, ventured upon pharmacy on the supposition that it was an unrestricted, easy and remunerative trade. Entering into competition with a class of pharmacists of superior education, an increasing multitude of practitioners of pharmacy of very unequal proficiency and attainments engaged in a common pursuit came more and

into the pursuit by the uncompromising condition of a higher degree of preliminary school education, as is the recognized advantage of the professions in most European countries. Only upon such a foundation can subsequent store experience and training and collegiate education erect a substantial professional superstructure.

* Amer. Journ. of Pharmacy, Vol. XLIII (1871), p. 157; Vol. XLV (1873), p. 479; Vol. XLVI (1874), pp. 391, 392; Vol. XLIV (1872), pp. 185, 190.

† Proc. A. Ph. A., Vol. XX (1872), pp. 47, 69; Vol. XXIII (1875), pp. 830, 840; Vol. XLIII (1895), p. 344.

‡ Pharm. Rundsch., Vol. XIII (1895), pp. 75, 77, 176. Proc. A. Ph. A., Vol. XLIII (1895), p. 453.

§ It cannot be denied that the arbitrary adoption of academic titles by colleges of pharmacy is an unnecessary and untoward digression from time-honored and sanctioned principles and usages, and yet it has been indulged in by various colleges of pharmacy in recent years. It remains, however, a matter of apprehension whether this innovation will prove its validity by the test of time and remain compatible with present and future academic and official prerogatives and canons.

more into close contrast. This in several directions disturbing condition of affairs in time gave rise to the desire for improvement and to the impression that this could be best attained by organization and subsequent efforts after legislative enactments for restricting the practice of pharmacy to properly educated and qualified pharmacists.

This problem and increasing trade degeneration became the chief impetus towards the organization of pharmaceutical state associations which, commencing in the State of New Jersey in the year 1871, have since been formed in most or all States of the Union. A closer inquiry will bear out the fact that the original projectors of most of these organizations were active members of the American Pharmaceutical Association. Realizing that the legal and commercial interests and problems of pharmacy in the various states, each one regulating its own affairs, could not be directed or guided by the national association, it was almost throughout the initiative action and prompting influence of local pharmacists who were enthusiastic members of the national association and inspired by public and professional interest, that most actively promoted the organization of pharmaceutical state associations.

These associations owe their origin as also the impetus and guidance towards their successful career largely to the influence and initiative example of the national association. They, therefore, should consider it a privilege and duty to stand in loyal allegiance to the time-honored parent Association and to work harmoniously with it in every common cause for the common good.

Representing and protecting, as they do, specially the business interests and trade affairs of pharmacists and druggists in the respective States, as clearly pointed out at the meeting of the American Pharmaceutical Association in the year 1890,* it should be the higher aim of the state associations to cede to the national association, as the foremost representative of the professional and scientific side of American pharmacy in general, the more important productions of scientific and research work to be recorded and stored for wider and permanent publication in the proceedings of the national association.

As its congenial adjuncts and aids, they should in all matters of general professional and trade concern aim to rise above sectional and local conceptions, and deliberately extend to the national association every numerical and moral support. Such a bond of union cannot fail to sustain and to enhance the usefulness and worth of the state associations, while adding strength and authority to the parent body.

RELATIONS TO THE AMERICAN MEDICAL ASSOCIATION AND TO FOREIGN PHARMACEUTICAL ASSOCIATIONS.

In its relations to the older sister association, the American Medical

* Proc. A. Ph. A., Vol. XXXVIII (1890), p. 66.

Association,* the American Pharmaceutical Association has extended at every opportunity its cordial co-operation, and in recent years has introduced the propitious custom, courteously reciprocated, of being represented by delegates to the Section on Materia Medica, Pharmacy and Therapeutics, at the annual conventions of the national medical association,† and of lending its aid in all matters of common interest to both professions.

On several occasions, the American Pharmaceutical Association has exchanged fraternal greetings with foreign pharmaceutical societies,‡ or extended felicitations to them,§ as well as to American || and foreign scholars.¶ It has bestowed its honorary membership sparingly to distinguished American** and liberally to foreign pharmacists and professional associates.††

The Association has participated by the attendance of members in the Centennial of Chemistry, held August 1st, 1874, at Northumberland, Pa.,‡‡ by delegates in the International Pharmaceutical Congresses, in the years 1867, 1869 and 1897,§§ and in the International Pharmaceutical Exhibi-

* Organized in the year 1847.

† Proc. A. Ph. A., Vol. XXXVI (1888), p. 56; Vol. XXXVIII (1890), p. 28; Vol. XL (1892), pp. 51, 54; Vol. XLV (1897), p. 79; Vol. XLVI (1898), p. 71.

‡ In the years 1863, 1864, 1870, 1885, 1886, 1888 and 1893, with the British Pharmaceutical Conference; in 1891 with the Pharmaceutical Society of Great Britain.

§ In 1870 to the "Norddeutsche Apotheker Verein." (Proc. A. Ph. A., Vol. XVIII (1870), pp. 115, 305; Vol. XIX (1871), p. 77.

|| In 1893 to *John M. Maisch* (Proc. A. Ph. A., Vol. XLI (1893), pp. 29, 49, 70); in 1899 to *Edward R. Squibb* (Proc. A. Ph. A., Vol. XLVII (1899), p. 103).

¶ In 1868 to *Prof. Christian Gottfried Ehrenberg* in Berlin (Proc. A. Ph. A., Vol. XVI (1868) pp. 104, 126.

** In 1856 to *Daniel B. Smith, Thom. Farrington, M. J. Bailey*; in 1857 to *George B. Wood, Franklin Bache* and *Elias Durand*; in 1898 to *Frederick Hoffmann*.

†† In 1868 to *Daniel Hanbury* and *Henry Deane* in London, *F. A. Flückiger* in Berne, *M. Robinet* in Paris, *A. T. De Meyer* and *Robert Gille* in Brussels, *Hermann Hager* in Berlin, *Friedrich Mohr* in Bonn, *G. C. Wittstein* in Munich, *G. Dragendorff* in Dorpat, *A. Casselmann* in St. Petersburg; in 1871 to *John Attfield* and *Theophilus Redwood* in London, *H. B. Brady* in New Castle, *I. L. Soubeiran* and *Chevallier* in Paris, *A. A. Délonde* in Sevres, *J. E. De Vrij* in the Hague, *Adolph Duflos* in Breslau, *H. Ludwig* in Jena, *A. von Waldheim* in Vienna; in 1872 to *Robert Bentley* in London, *Stan. Martin* in Paris; in 1877 to *G. Planchon* in Paris, *L. A. Wiggers* in Goettingen, *Edw. Schaer* in Zürich, *X. Landerer* in Athens; in 1882 to *Peter Squire, Thomas Greenish, G. W. Sanford, M. Carteighe, Joseph Ince* in London, *R. Reynolds* in Leeds, *G. F. Schacht* in Clifton, *Christ. Brunnengraeber* in Rostock, *J. Martenson* in St. Petersburg, *Nic. Sinimberghi* in Rome; in 1898 to *Wm. Martindale* in London; in 1899 to *E. M. Holmes* in London, *Ernst Schmidt* in Marburg and *David Hooper* in Calcutta.

‡‡ American Chemist, Vol. V (1874), pp. 38, 113, 200.

§§ Proc. A. Ph. A., Vol. XV (1867), p. 314; Vol. XVII (1869), p. 349. Vol. XLV. (1897), p. 6; Vol. XLVI (1898), p. 103.

tion, held in Prague in August, 1896.* It has repeatedly invited foreign national pharmaceutical associations to hold an international congress in the United States,† and such an invitation was accepted in the year 1893, when the seventh International Pharmaceutical Congress assembled in Chicago.

PROSPECTS FOR THE FUTURE AND CONCLUDING REFLECTIONS.

A retrospect of work accomplished and of success realized in the course of half a century naturally leads to a cursory outlook into the future. The founders of the Association entered upon their venture not without some apprehension, and this inherent characteristic of all human efforts prevails to this day, although perhaps in a different form and direction. The fact, however, cannot be passed by in this brief survey without being referred to, that the art of traditional pharmacy, as mentioned before, has undergone a sweeping change in recent years and has suffered a displacement of its original essential functions, brought about by the prodigious advance in the kindred sciences and arts, by specialization in most domains of application, by more rational and restrictive methods of medication, and by the ascendancy and validity of pharmaceutical manufacturing industries, abolishing the apothecaries' laboratory of old and relegating the pharmacist more and more to the position of a purveyor and dispenser of the ready-made products of the manufacturer. The pharmacist individually is powerless in this untoward drift of his once integral and fixed sphere of application. All recent experimental efforts for an amelioration of excessive overcrowding and competition and consequent trade decadence by presumptively protective trade unions and various more or less Utopian vagaries for checking the wheels of industrial and economic progress will continue to prove unavailing. Remaining abreast of the general professional and industrial progress, cultivating proficiency and integrity within the profession, continuing in harmonious contact with the coordinate medical and sanitary advance and in friendly relations with the medical profession, sustaining the usefulness to, and the respect and the confidence of the community, strengthening the spirit of solidarity and common aims and interests among the fraternity, and standing united under the flag of the National Association, may prove the redeeming expedients for the salvation and unimpaired stability of American pharmacy in all phases of professional and trade fluctuations.

It is a matter of joyful gratitude at this semi-centennial anniversary to recall the good and efficient work accomplished by the Association. If we bear in mind the early and unremitting efforts of the

*Proc. A. Ph. A. Vol. XLIV (1896), p. 7. Pharm. Review, Vol. XIV (1896), p. 217.

†Proc. A. Ph. A., Vol. XVIII (1870), p. 38; Vol. XIX (1871), pp. 70, 74; Vol. XXII (1874), p. 471; Vol. XXIII (1875), p. 771; Vol. XXXIX (1891), pp. 13, 24, 41, 647.

Association to improve the drug market, to bring about suitable and efficient laws to prevent the importation of inferior drugs and home adulteration, to regulate the indiscriminate trade in poisons, to restrict quackery and empiricism, to secure suitable apprenticeship and better professional education, to foster pharmaceutical literature and to encourage and diffuse study and knowledge, and to elevate and strengthen the ethical standards of the profession, the fact confronts even the sceptical inquirer that to-day there is no difficulty in procuring drugs and chemicals of unquestionable quality because the drug market, which fifty years ago was in so deplorable a condition that the scorn of the better elements in the ranks of pharmacy brought about the organization of this Association as a protest against prevailing abuses, has been raised to its present satisfactory and reliable condition. Substantial education can be had in a large number of university schools and colleges of pharmacy in every section of the country, and higher post-graduate studies may be accomplished in American universities and laboratories just as well and as fully as abroad. Restrictive legislation has checked the ingress of incompetency and license, and national pharmaceutical literature and journalism have been developed commensurate with the status of American pharmacy and the intellectual culture and material progress of the country and our time.

The unobtrusive influence of the Association is felt within and without the scope of the profession, and its superior standing will continue to be recognized and appreciated at home and abroad, no matter how large or how limited the numerical percentage of its members may be in proportion to the total number of pharmacists and druggists in the United States ; for the strength and worth of professional associations, embracing the elite of the calling, rests less in figures than in the quality and calibre of their constituent members.

In virtue of these prerequisites and the inheritance of a creditable past, the American Pharmaceutical Association is entering upon the second half-century of its existence. While its founders have all passed away, and the older generation of its members is falling out of line one by one, it is a consolation to those remaining to see quite an array of younger men stepping into the vacant places, well educated, many with superior academic training, engaged in the practice of dispensing or manufacturing pharmacy, in manufacturing and research laboratories, or teaching in schools of pharmacy. They are infusing fresh blood and spirit and imparting old and new ideals into the patriarchal body of American pharmacy. Their inspiring and progressive influence cannot fail in time to redress prevailing shortcomings, to ameliorate existing degeneration and to sustain and strengthen the professional status and the ethical standards of legitimate pharmacy, secured in the course of more than a century.

At this age of growing specialization in all domains of knowledge and

application, of increasing overcrowding and multiplying competition in every pursuit, and of stricter requirements as to competence and character in the individual, it is a blessing that there remains in our great country a conservative national union of pharmacists, broad and elastic enough to include the entire range of scientific, professional and trade application and interests, and to embrace all grades of practicing, manufacturing, commercial and teaching members of our liberal and noble profession.

With such prospects, the veterans of this organization may confidently entrust its further development to coming generations, cherishing the hope that American pharmacy, its professional superstructure and its time-honored representative Association will continue to hold their own, and to endure the storms and vicissitudes which they may have to encounter in the course of further progress and in the mutations of incessant industrial and trade evolution.

Prolonged applause followed the reading of Dr. Hoffmann's able and interesting address.

THE PRESIDENT: We have listened to an interesting pen-picture in retrospect of the American Pharmaceutical Association. This organization has upon its records forty-eight ex-Presidents. Of that number, twenty-one are living to-day, and of the twenty-one living ex-Presidents, we have eighteen in attendance at this golden jubilee meeting. (Applause.) Now I desire to present to you a living picture in retrospect of the American Pharmaceutical Association, and as our General Secretary reads the names of the ex-Presidents, I will ask them, as their names are called, to stand up where they are, and remain standing until the list is complete. (Applause.)

The Secretary called the roll, and the following gentlemen, ex-Presidents of the Association, arose and stood in their places, each being applauded as he did so, the spectacle giving impressiveness to the occasion, and being a strong reminder of the Association's past, the history of which they had figured so largely in making :

William J. M. Gordon, Cincinnati, 1864.
Ezekiel H. Sargent, Chicago, 1869.
Enno Sander, St. Louis, 1871.
Albert E. Ebert, Chicago, 1872.
John F. Hancock, Baltimore, 1873.
C. Lewis Diehl, Louisville, 1874.
William Saunders, London, Ont., 1877.
George W. Sloan, Indianapolis, 1879.
James T. Shinn, Philadelphia, 1880.

John Uri Lloyd, Cincinnati, 1887.
Joseph P. Remington, Philadelphia, 1892.
Edgar L. Patch, Boston, 1893.
William Simpson, Raleigh, N. C., 1894.
James M. Good, St. Louis, 1895.
Henry M. Whitney, Lawrence, Mass., 1897.
Charles E. Dohme, Baltimore, 1898.
Albert B. Prescott, Ann Arbor, Mich., 1899.
John F. Patton, York, Pa., 1900.

President Henry M. Whelpley was called for, against his protest, to complete the list, and was heartily applauded as he arose.

THE PRESIDENT: I will say that this is a living picture which can never be reproduced. But I notice that the audience is anxious to get a better view of the picture, and I will ask the ex-Presidents on each side to step into the aisle, or cross over, so that the audience may get a better view of them.

As the ex-Presidents crossed over from one side to the other, passing in the middle, Moderator Whelpley remarked :

Gentlemen, the ex-Presidents that passed at the Semi-Centennial! [Applause.]

The President announced that the three living ex-Presidents who were not able to be present on this occasion were :

Frederick Stearns, Detroit, 1866.

A. K. Finlay, New Orleans, 1891.

Joseph E. Morrison, Montreal, 1896.

THE PRESIDENT: The next feature on the program is an address, "The Advance in Pharmaceutical Manufactures During the Past Fifty Years," by one whose name has much longer been identified with this branch of pharmacy—the name of Schieffelin.

Mr. Schieffelin was complimented by the applause of his audience as he came forward on the rostrum to read his paper, but, before proceeding, stopped to say :

Mr. President, and Gentlemen of the American Pharmaceutical Association:

Last night a lady asked me if I regarded myself as the grandfather of the American drug business, and I said no, but I was the great-great-grandson of it, because I was one of the fifth generation in a straight line that had been in the drug business in New York. [Applause.] I recognize that it is for this reason that I am so honored to-day, and I wish here to express my appreciation of that honor. When your Secretary told me my subject was to be "The Advance in Pharmaceutical Manufactures During the Last Fifty Years," and that the time allowed me to present it was fifteen minutes, I thought he was surely joking; but when I recognized that there would necessarily be a number of other subjects, and the time of the Association limited, I could understand how it was. I shall endeavor, first, to give a brief statement of the reasons for the existence of pharmaceutical manufactures, and then a sort of bird's-eye view of the growth of the business.

Mr. Schieffelin then read his paper as follows :

THE ADVANCES MADE IN PHARMACEUTICAL MANUFACTURES DURING THE PAST FIFTY YEARS.

BY WM. JAY SCHIEFFELIN.

In their scale of operations, in the use of machinery, and in the variety of their products, pharmaceutical manufactures have developed more during the past fifty years than through all the preceding centuries.

In 1852, when the medical world was emerging from the Jalap and Calomel age, the pharmacist made his own galenicals, pills and elixirs, and bought the crude drugs. Most of the manufactured products purchased by him came under the class of heavy chemicals, and were of mineral origin. Besides the common acids, alkalies, alum and sulphur the list included the mercurials, lunar caustic, arsenic and powder of algaroth, sugar of lead, sulphate of zinc, magnesia, bromide and iodide of potassium, and Labarraque's solution.

Alkaloids and organic compounds were few and were used in very

limited quantity. Morphine and quinine, chloroform, alcohol, ether and collodion, besides acetic, tartaric and oxalic acids were the chief ones. But in 1852 the opening of the Hudson River and Erie railroads, followed by the Pennsylvania railroad in 1854, made it possible for the druggist to get his preparations more quickly than he could make them, and at no greater cost ; while the consolidation of fifty different telegraph companies which began in 1851, enabled him to send his orders instantaneously.

The Civil War, with its demands for medical supplies, stimulated the manufacturers ; the need of large quantities of pure extracts, led Dr. Squibb to establish his laboratory, and the abilities of that great man were devoted to perfecting the processes of pharmaceutical manufactures.

His many researches and improvements freely published in the *Ephemeris* take the lead in importance and value, and he must be counted among the benefactors of humanity.

His process of preparing fluid extracts by cold repercolation may be put at the head, and his suggestions on the valuation of drugs and the assay of opium, on the manufacture of ether, acetone and cocaine, and of acetic extracts should not be forgotten.

Among those who have passed away and who should be remembered with honor and gratitude for their services to scientific pharmacy in America, are Procter, Maisch and Rice. These men made the United States Pharmacopœia the most perfect book of its kind in the world.

The Pharmacopœia, with its formulæ constructed on a scale intended for the convenience of the retailer, became, nevertheless, a guide to the manufacturer, and the retailer found it advantageous to buy his standard pharmaceuticals ready made. The reasons for this are truer to-day than they were then ; they are as follows :

1. The retail pharmacist cannot devote the time to manufacturing.

2. Making fluid extracts in small quantities is uneconomical because of the loss of the alcohol, which is recovered in a large way ; the cost of labor, which would be about the same for one liter as for two hundred liters ; and the forming of a deposit in many extracts which would never have time to clarify if used at once for dispensing ; then the standardization of alkaloidal extracts would greatly increase the cost of one liter, but not of two hundred.

3. It is very evident that a million pills or tablets can be more cheaply made than a hundred, and it is extremely convenient to have pills and tablets of a given formula all of one size with the materials evenly distributed. The retailer demands and receives liquid preparations which remain clear and emulsions that do not separate ; it may be doubted if this would always be the case if he made them himself. Therefore the large manufacturing plants of to-day have developed. Fifty years ago the manufacturers supplied small quantities of morphine, chloroform, ether, galenical extracts, elixirs, opodeldoc, mercurial and other salts. Ten years

later the list of fluid extracts had greatly increased; while in 1870 extracts with glycerin were in favor. Then the coated pills were introduced and the business increased to very large proportions until the cheaper tablets and triturates partially replaced them.

In 1857, a paper was read before the American Pharmaceutical Association mentioning gelatin capsules, sugar-coated pills, cod-liver oil emulsion, and the effervescing salts which Mr. Maisch had described the year before: it is remarkable that so many years passed before all these came into general use. The soft gelatin capsule is one of the greatest improvements in administering drugs that have been made.

In 1885, the synthetic remedies were introduced from Germany. Antipyrine was soon followed by acetanilid, phenacetin, sulfonal and many others. Our schools of science awoke to the value of research work when the learned and patient Germans produced these preparations.

The English and French chemists had supplied scarcely any synthetic remedies, and so the backwardness of the Americans would not have excited much comment, were it not that certain persons put on the market mixtures containing chiefly acetanilid, proclaiming them as new chemical compounds, great American discoveries, and which were the cause of much disparagement and ridicule of American methods of synthesis.

Nearly all of these imitation synthetics have disappeared, and it is a reproach to us that any have survived, for there can be no denying that to launch a product by a misrepresentation is disreputable.

In every succeeding year new remedies, genuine synthetics, have appeared. Among those which have survived and are in considerable demand to-day may be mentioned: Acetanilid, antipyrine, aristol, chloralamid, creosotal, formaldehyde, heroin, phenacetin, phenocoll, salophen, salol, sulphonal, thiocoll and urotropin. Besides the older organic compounds, chloral, chloroform, carbolic acid, ether, ethyl nitrite, iodoform, naphthalene, and salicylic acid.

Ethyl nitrite is made in several American laboratories, and its consumption here approaches forty thousand pounds a year. The makers of essential oils also manufacture synthetic perfumes and flavorings, such as vanillin, coumarin, saccharin, ionone and heliotropin, oil of sassafras and oil of wintergreen.

In these processes the organic solvents are largely used—alcohol, ether, naphtha, chloroform, acetone, etc. The German maker with cheap alcohol has an immense advantage over the American, and if the tax could be removed from alcohol used in the arts, our progress would be unimpeded.

Electro chemistry has but slightly affected pharmaceutical manufacturing—iodoform, vanillin, carbon disulphide and hypochlorites are beginning to be manufactured with the aid of the electric current.

The making of infants' and invalids' foods is a branch by itself, and the

digestive ferments are prepared with liquids and solids in efficient and attractive form.

Manufacturing on a large scale requires apparatus in proportion, so the beakers and glass jars are replaced by earthenware pots, enamelled iron tanks of one hundred and twenty gallons to three hundred and fifty gallons capacity, block-tin tanks of five hundred gallons, and chemical lead tanks of two thousand gallons. The liquids are transferred by centrifugal pumps, by steam syphons or compressed air, and precipitates, though as heavy as sand, can also be pumped, because these pumps are similar to the large ones used in marine dredging, of which it is reported that recently one pumped up an anchor weighing 80 pounds without injury or interruption.

The drug mills are of every kind. For fine powdering the chaser is most used, then the ball or pebble mills. Grist mills with burr-stones are still much used, and steel rolls; while high speed pulverizers, rotary cutters, and crushers take the leaves and roots.

While in pharmaceutical machinery the Americans are far in the lead, the German apparatus for work in organic chemistry is pre-eminent; think of an autoclave, lined with acid-resisting material, having a capacity of five hundred liters, with stirring paddles, working under a pressure of sixty atmospheres.

Ingenious machines are now very generally used in American pharmaceutical laboratories. The modern pill machines are marvelous, especially the final one, holding the pills by suction as they are dipped in the coating, which enables one girl to coat one hundred thousand pills in a day; and tablet machines are now in use which stamp twelve tablets at one stroke and make five hundred thousand in a day. One young girl attends two machines and thus makes one million tablets in a day.

Perhaps the two greatest aids to manufacturing pharmacy are vacuum distillation and centrifugal extraction; the former has long been in use, but the latter has only come into general use in this country during the past fifteen years.

The immense filtering racks and presses that formerly encumbered a laboratory are now usually replaced by centrifugal machines which take up but little room and save much time, while the quantity of wash liquor is so reduced that the loss by washing is unimportant. The cheapness of certain leading products is due almost entirely to these machines—Aloin is an example, as it must be well, but quickly, washed or it is decomposed.

Fifty years ago the medical world was much interested in glycerin as a remedy for the skin, as a solvent for drugs and as a vehicle for administering them. The use of it has grown to vast proportions, and the service done by Chevreul should always be acknowledged. I had the privilege of visiting him in Paris, when he was a hundred years old, and of expressing the gratitude and admiration felt in America for his discoveries. He

replied with a bright smile that he had always admired Americans, and regretted that he had never been able to visit us.

Glycerin, ox gall, and vaccine were almost the sole animal products on the druggist's list in 1852, but pepsin soon followed, and pancreatin, while during the past ten years the laboratories have annexed the barnyards, and the serums and toxines and extracts from glands have become of great importance. These biological departments are under the direction of scientists trained in bacteriology, which demands niceties of cleanliness and carefulness of sterilization that would be a revelation to the apothecary of fifty years ago.

The makers of plasters and surgical dressings also have splendid vacuum appliances of great size for sterilization.

Extract of Malt is made tons at a time in low-pressure vacuum pans, while diastase is prepared in a wonderfully active state.

By-products of the huge packing houses are extract of beef, pepsin and pancreatin, and stearin; while the creameries make sugar of milk and casein.

Returning to our laboratories, the important galenicals they make besides the extracts are aloin, santonin, resin scammony and resin of podophyllum. Then a variety of emulsions, elixirs, syrups, and medicinal wines.

The large pharmaceutical laboratories have been laudably enterprising in their search for new drugs, and have introduced some of great value, Cascara for instance.

The demand for the chief alkaloids has steadily increased until the production of quinine and morphine has become enormous. The estimated annual consumption of quinine in the United States is five million ounces, and that of morphine is four hundred thousand ounces.

The manufacture of strychnine, caffeine, and cocaine has developed so greatly that it seems at the present time to be ahead of the consumption, large though it be.

Fifteen years ago cocaine was sold by the grain, and now its annual consumption in this country approximates one hundred thousand ounces.

Most of the mineral acids and salts sold by the druggists are heavy chemicals and are now made by the combination. Rochelle salt, cream of tartar, magnesia, borax and chlorate of potassium have long since outgrown the pharmaceutical laboratories; but these still make the salts of bismuth and certain salts of iron and manganese and of mercury, besides iodides and bromides and phosphates and peroxide of hydrogen, while latterly several have undertaken the manufacture of lithia from its minerals, Lepidolite from California and Spodumene from Dakota, with the result that the price has fallen in two years from \$3.30 to \$1.30 a pound; because the capacity of the plants is perhaps double the consumption, which is about sixty thousand pounds a year.

So the pharmaceutical chemist, like the alchemist of old, finds his material in rare and beautiful minerals, in the cells of outlandish plants and in the blood of live animals ; but his processes are lighted by the lamp of science, and instead of working with a few ounces he operates with quantities of thousands of pounds. The future of pharmaceutical manufactures is bright, for the standards are right, which is largely due to the men of this Association and their like.

The address of Mr. Schieffelin was generously applauded.

THE PRESIDENT: I am sure that those who read the volumes of the American Pharmaceutical Association recording the Proceedings of this meeting will be as much pleased as we are to have the records in regard to the manufacture of chemicals placed in such a concise and interesting manner. We are certainly indebted to Mr. Schieffelin for his paper.

The next paper is entitled, "Our Centennial," by Mr. John Uri Lloyd, of Cincinnati.

Mr. Lloyd was the recipient of applause from the audience as he advanced to the front to read his paper. After stating that his paper was short and his voice not strong, and he would therefore ask the close attention of his audience, Mr. Lloyd read with much effect, despite the disability under which he labored, the following classic production :

OUR CENTENNIAL.

BY JOHN URI LLOYD.

Strange, is it not, that standing as to-day we do in the fulfillment of this semi-centennial of our Society, one among us should look forward and venture to refer to "Our Centennial" as though the years that separate us from a future period, doubling as they must the age of our Society, were here? And even more strange is it that one who feels assured that neither matured friend nor himself will then stand here, should thus preface his remarks and thus title his subject. Few among the very youngest men present can hope to meet with those who, fifty years from now, will celebrate this centennial anniversary. Audacious, then, in view of these facts, is it not, to head this paper "our centennial," this paper which bespeaks an event destined to occur more than a generation hence?

Let us, however, ask whose by right is the semi-centennial jubilee we hold this day? Let us see who it is that stands conspicuous in all that takes our thought and action on the present occasion. Surely not you and I, my friends, even though we may have been in rank these many years, even though a few can look back to the very beginning. You who listen to these words, you whose faces, be they young or old, turn upon me as I speak, meet not here to celebrate your own good selves. Even the concern of the pioneer is not in laudation of his own works, he celebrates not himself. Nor do we meet to glorify those whose names on our printed program are designated as taking part in these exercises. Nor to

those whose turn it is either to precede or follow me this day in a word of tribute or a kindly offering in behalf of this Society's semi centennial. Nor yet to those of our members whose business cares or physical misfortunes prevent their personal presence on this happy occasion. This is not a self-admiration society. The men who move before us and speak aloud this day do not, on their own account, bring us together on this our markedly eventful session.

No. The unseen touch that comes to each heart, as memory tells of the past and of men no longer with us, beats the throb *no*. The silent voice that no longer vibrating air or touching ear, yet clear and distinct both in accent and modulation, lingers in recollection to him who knew it once, bids us speak the word *no*. The printed line that tells of action done by an ever-to-be absent comrade lies in a volume on our shelves, but the words are not a slumbering nothing. To us who heard their creator speak they yet linger in realms realistic and bid us give credit to absent friends who earned their part in this semi-centennial of our Society. Behold, where sits the present secretary rises to our mind's view another face. Where stands our president, a chain of absent faces uplift themselves. Our treasurer has genial company in our thought. Where sit those ex-presidents and officers, we, who look upon them, see other forms. Where journalists, authors, scientists, educators, men of learning and men of action gather before us, others wedge in, invisible to all but such as knew these other men in these places. Messages of kindly greeting offered in days gone by awaken as their faces spring before us and touch our hearts. Conjured into shape and form are these greetings by memory's charms, but real as life are they to him who feels the touch. Gone are the rivalries, the antagonisms, the differences and varying ambitions of all these men. Lost are they to sight and touch under the soporific influence of the hand that winds the years away.

Let us not mistake, my friends, the dominating feature of this semi-centennial of our Society is the tribute of praise we offer our absent comrades. A monument of love it is to their good works, and our joy is largely in this opportunity to voice our pride in their gift to humanity, our inheritance.

Bid now a momentary farewell to the phalanx memory creates. Turn thought onward. A second fifty years begins. The future looms before us. The spindle of time turns, the years reel off. One by one the faces of the men present this day turn to dust and disappear in vacancy. The babe unborn creeps, rises and stands upright, strong in life's pride. The child of to-day becomes of age mature. The Society lives on. Then comes at last another knot in the line Time spins. A second day of jubilee is here. Another fifty years have passed.

Unheard are the voices of those who this year, 1902, made the call for this semi-centennial. The printed envelope bearing the invitation of this

second jubilee celebration is dated 1952. It comes to our homes. The program of the day bears not our names. Men we have never seen have taken our place in thought and work. Gone are we into the silences. Other feet seek this spot where their forefathers, one hundred years before, met to organize the society that, through our hands, came into their keeping. Their eyes turn backward, as ours do now, and we are seen as we now behold those who met in this place fifty years ago. To the mind of him who then thinks, and of him who then reflects, will come a cherished touch, like that which comes to you now, my friends. The same, it must be the same, and yet not altogether the same. As we look back and note the stopping place of this or that friend, whose work we now celebrate in this semi-centennial, so must they look back, but not upon the same memory creations. The program of that eventful occasion will be marked *Centennial*, not *Semi-Centennial*, and those who celebrate the occasion will meet, not to glorify themselves, but to honor all whom we meet to honor and, I bid fair to hope, ourselves as well. It will be their jubilee session in honor of *Our Centennial*—the centennial that marks the uplifting of heart monuments to absent comrades.

Let us, then, in this jubilee greeting we offer to our past comrades, hope and trust that when the next fifty years have been unwrapped and the second call is made, the part we have taken in behalf of this Society may bespeak for us in kindly touch the backward thought of those who join therein.

Mr. Lloyd's paper was greeted with great applause.

THE PRESIDENT: The paper we have just listened to bears the title, "Our Centennial." May I be permitted to add a sentiment? It is by John Uri Lloyd. May he live *to attend* our centennial! [Applause.]

The next thing on our program is an address on "The Father of American Pharmacy, William Procter, Jr.," by Mr. Albert E. Ebert, of Chicago.

Mr. Ebert, who was applauded also as he advanced to the rostrum to speak, then presented the following address in fine voice and with excellent effect:

THE FATHER OF AMERICAN PHARMACY—PROFESSOR WILLIAM PROCTER, JR.; BORN BALTIMORE, MD., MAY 3, 1817; DIED PHILADELPHIA, PA., FEBRUARY 9, 1874.

BY ALBERT E. EBERT.

To compose a eulogy on the life and work of Prof. Procter, is a pleasure to which an old-time pharmacist should bring his best thought. But this has already been done by abler minds than mine. It may not, however, be a work of supererogation to add another tribute to his memory as a teacher, a writer, and as the founder and leading spirit of the American Pharmaceutical Association. William Procter, Jr., with but a limited edu-

cation, yet by hard and unremitting labor and study placed himself in the front rank of American scholars. He built his life, line upon line, by his own unaided efforts. He was a self-made man in the best sense, for his own early struggles had taught him to put himself in another's place, and to give the help he, in former years, would have been glad to receive. From the day of his graduation from the Philadelphia College of Pharmacy in 1837, his life seemed to be devoted wholly to the interests of the profession. In 1840 he became a member of the college from which he graduated, and from that time to the end of his life, he was one of its most distinguished sons. When he became a professor of the college, he founded the course in the Theory and Practice of Pharmacy, which, prior to its introduction by him, had not been practically applied. His contributions to the literature of pharmacy have been greater than those of any other American; for more than a score of years he was editor of the American Journal of Pharmacy, and the breadth of his researches and the conscientious accuracy with which he discharged the duties of that position, are attested by the volumes of the Journal which appeared during the years of his incumbency. Prof. Procter was extremely conscientious in giving credit to every writer and investigator who had contributed to the advancement of pharmacy. As editor, he scrutinized with care every paper submitted, and his wide knowledge of everything pertaining to the profession enabled him to prevent errors, and to give to every man exact credit for whatever originality he might possess. He never gave to one man credit for work that belonged to another, nor did he willingly allow any investigator to claim the work of another man as original with himself.

Prof. Procter was a member of the Society of Friends. He was a man of unusually pure mind and character. He had the rare faculty of being able to concentrate his mind, amid the pressure of a multitude of distracting circumstances, and in this way, he was able to accomplish wonderful results. He was ever genial, even of temper and unruffled by any of the cares of his college or professional life. He was a man of truly rare and excellent heart, with a mind so great and so richly endowed with learning, that such another has not yet been born to fill his place.

The American Pharmaceutical Association was the offspring of Prof. Procter's able and versatile mind. Throughout the years of his life which followed the organization of this body, he gave to it the richest treasures of an intellect, fitted beyond all others for the work which he had undertaken.

It was in October, 1851, that Prof. Procter, with Charles Ellis and Alfred B. Taylor, went as delegates to a meeting in New York, called by the New York College of Pharmacy, to consider a law relating to the inspection of drugs at the Custom House. At this gathering was born the idea of a national association, and Prof. Procter was the first to grasp the true scope and utility of the project. From this time, until the time of his

death, by voice and pen, he contributed to the strength of the Association. His contributions to the annual Proceedings of the Association covered a wide and varied range of topics, and were enriched by his large researches, and by the versatility of his mind, which was to an eminent degree that of the logician and the original investigator. His English style was pure, free from pedantry and showed a rare simplicity and directness. His love and enthusiasm for the work of the Association was one of his most distinguishing characteristics. It is a great pleasure for me to remember him when I, as a student, knew him in his modest store in Philadelphia, and during those rare days in Europe, when I had the pleasure of being his traveling companion. I remember that it was Professor Procter's desire to attend a meeting of the British Pharmaceutical Conference, and at the time we were in Germany such a meeting was about to be held in Dundee, Scotland. The time of the meeting was almost coincident with that of the American Pharmaceutical Association, and, notwithstanding his strong desire to be present at the meeting of the British Pharmacists, he nevertheless felt it his duty to return home and be present at the meeting of the American body. He requested me, however, to go on to Scotland and be present at the Dundee meeting, and I can state that the greatest regrets were expressed at the absence of Professor Procter, for among the pharmacists of Great Britain his contributions to the profession were especially well known, and his British friends had looked forward with solicitude to a more personal and intimate acquaintance.

During our attendance at the International Pharmaceutical Congress in Paris in 1867, Professor Procter was chairman of the United States delegation, and he was made one of the vice-presidents of the Congress. He was here the recipient of marked attentions from all of the most distinguished delegates, among whom his work and his abilities were well known. The reception he received from such men as Anton von Waldheim, of Vienna, Dr. F. A. Flueckiger, of Switzerland, Dr. Cassellmann, of St. Petersburg, Dr. Dittrich, of Prague, and Profs. Liebig, Wittstein and Buechner, at Munich, was most flattering.

The pharmacists of America ought not to let the memory of their most distinguished colleague fall into oblivion. They should keep the memory of William Procter green in their hearts, and should give him a monument more lasting than stone or bronze, a monument built in their affections, and in the affections of those who come after them. Let us remember that the favorite child of his genius was the American Pharmaceutical Association. It was here that his work became as broad as his country.

As a teacher, Professor Procter came in contact with a limited number of students; as editor of the American Journal of Pharmacy, his field, of course, was wider; but it was through his connection with the American Pharmaceutical Association that the scope of his labors became truly national in its character. This Association owes to him more than to any

other man, and could we ask him what, if anything, he would have us do as a memorial to him, he would undoubtedly answer that it would please him most for us to devise a way to perpetuate for time to come the life of the American Pharmaceutical Association. That, done in honor of his memory, would surely gratify him more than anything else we could do. We shall, no doubt, listen to a proposition for perpetuating the American Pharmaceutical Association in the name of William Procter, Jr., at this semi-centennial meeting. Whatever we can do in aid of a cause so worthy must be well done. For itself, and in honor of the memory of its most distinguished founder, William Procter, the American Pharmaceutical Association deserves and must receive the most earnest, the most sincere, and most affectionate thought of us all.

Mr. Ebert's address upon a subject so near to the hearts of the members of the Association was received with much favor and handsomely applauded.

Mr. Lemberger, of Lebanon, Penna., was then called on, and read the last paper upon the formal program, his presentation of his subject being very heartily applauded when he had finished.

STATUS AND LANDMARKS OF AMERICAN PHARMACY AND THE DEVELOPMENT OF PHARMACY DURING FIFTY YEARS.

BY JOSEPH L. LEMBERGER.

Reminiscences call up things, events and persons of yesterday, the recalling of which will serve my purpose in responding to the duty assigned me as a help to the proper celebration of this fiftieth anniversary.

Our early recollection of this Association, as a young man, comes to us with feelings akin to an inspiration. I remember the impression made upon me that I was about to become associated with a great body, and when I gazed upon what was then the personnel of the American Pharmaceutical Association I soon discovered on coming into closer fellowship, that it was a privilege for a young man to meet and associate with the men that composed that body—men that made American pharmacy what it then was and moulded influences which have continued to develop and perpetuate the art as we find it to-day; men who with prophetic vision at their initial meeting seemed to foresee the great necessity of safeguarding the nation against the admission of drugs of only full standard purity, who in this act recognized that quality and not quantity for value was the safe method, and that integrity and skill, if rightly applied, would commend their acts and would win to their confidence and fellowship the Colleges of Medicine and Pharmacy and the most able druggists and chemists of the land; these men were inspired by no selfish but rather the higher philanthropic motives. The men of that Association were they who in their day made and revised our Pharmacopœias and constructed our formularies, made and contributed to our useful dispensaries, chemis-

tries and treatises on pharmacy, making the high professional standard, bequeathing it as a legacy for those who take their places to-day. Delightful indeed is this duty to recall the pioneer service performed by that patient, industrious body who builded so wisely and made possible our partnership and succession to the inheritance manifest in this interesting assemblage.

Do we inquire who were these noble men? Glance over the pages of our own history, or gaze upon the walls of this assembly hall, and see some of those worthies looking upon us in mute picture and perhaps with us in spirit communion.

Education marks every stage of progress in the advancement of all science, and it will not seem strange, therefore, that early in the history of this Association the wisdom of the pioneers was directed towards a higher education, proper instruction, and careful moulding of the learners or the apprentices. Many young men of that day became apprentices to the drug business only by the English custom, the process of legal indenture, and the writer enjoys the memory of an apprenticeship of this character for six years and seventeen days; and whilst the continuance of this plan is almost obsolete, it cannot be properly a part of this paper to discuss the question, the fact is introduced only to locate this landmark of the times of fifty years ago and to recall the fact that as early in our history as 1854 an address was promulgated by this Association, giving expression to the importance of adopting some measure by which the then present and future apothecaries of this widely-extended country may be improved in their educational standing.

Prior to and since the organization of this Association, there existed and have been established colleges of pharmacy that have largely, through their delegations or representatives to the annual meetings, contributed to the progress of the science, and as a significant witness, thirty-one colleges of pharmacy and twenty-three departments of pharmacy in colleges and universities have been founded as noted here consecutively and in the order of their founding, and our table of landmarks would be incomplete without emphasizing the value of their work in the line of educational pharmaceutical progress; and let it be noted also with much interest that the initial meeting of this Association, called the National Pharmaceutical Convention, was assembled on the call of the New York College of Pharmacy, and at the meeting when the name was established and adopted, the American Pharmaceutical Association, five Colleges of Pharmacy and one Pharmaceutical Society are recorded as being represented, viz: Massachusetts College of Pharmacy, College of Pharmacy of the City of New York, Richmond Pharmaceutical Association, Cincinnati College of Pharmacy, Maryland College of Pharmacy, Philadelphia College of Pharmacy.

ROSTER OF COLLEGES AND DEPARTMENTS OF PHARMACY.

Philadelphia	1821	School of Pharmacy, N. W. University	1886
Massachusetts.....	1823	Buffalo College.....	1886
New York	1829	Dep't Pharmacy, Scio Col.	1888
Course in Pharmacy, Med. Department		Dep't Pharmacy, S. Dak. Agricultural	
Tulane University.....	1837	College	1888
Maryland	1841	Dep't Pharmacy, Detroit College Phar-	
Cincinnati	1850	macy	1889
Chicago	1859	Meharry Pharmacy, Dep't Cent. Tenn.	1889
St. Louis	1864	Leonard School Pharmacy, Dep't	
Dep't Pharmacy University, Alabama.	1866	Shaw University, N. C.	1890
Dep't Pharmacy, Howard University,		Highland Park Col. Pharmacy, Iowa	1890
D. C.	1868	Brooklyn Col. of Pharmacy	1891
University Michigan	1868	Dep't Pharmacy, Atlanta Col. Phys.	
Louisville Col.	1870	Surg.	1891
California Col. Phar., Dep't University,		New Jersey Col. of Pharmacy.....	1892
Cal.	1872	College of Pharmacy, University Min-	
National College of Pharmacy, Wash-		nesota	1892
ington, D. C.....	1872	Dept. Pharmacy, University Texas....	1893
Pittsburgh	1878	Dep't Pharmacy, University College of	
Dep't Pharmacy, Vanderbilt Univer-		Medicine	1893
sity, N. C.	1879	Pharmacy Dep't, Oklahoma, Wis.	1895
Albany.....	1881	Dep't Pharmacy, University, Wash-	
Iowa Col. Pharmacy, Dep't Drake		ington	1895
University	1881	College Pharmacy, Med. Col. S. C....	1895
Cleveland	1882	Alabama Polyt. Institution... ..	1895
School of Pharmacy, University, Wis-		Ph. Dep't University N. C.....	1896
consin	1883	School Pharm., Washington Ag. Col..	1896
School of Pharmacy, Purdue Univer-		Virginia School Ph., Med. Col. Virginia.	1897
sity	1884	Dep't Ph., Col. Ph. and Surg., San	
Dep't Pharmacy, Ohio Normal Univer-		Francisco	1898
sity	1884	Col. Ph., Sewanee Med. College, Tenn-	
Dep't Pharmacy, University Iowa	1885	essee	1898
School of Pharmacy, Kansas	1885	Pharm. Medico-Chirurgical College,	
Kansas City Col. Pharmacy	1885	Philadelphia	1898
Dep't Pharmacy, Ohio State University.	1885		

There have sprung from these educational centres those influences that demanded higher qualification to safeguard the public welfare, and in course boards of pharmacy have been established in many of the states of this continent and laws have been enacted to regulate the practice of pharmacy. State pharmaceutical associations have gathered inspiration from this mother Association of ours, whose laws are patterned after our constitution, and the greatest success of the State Association is with those who adhere closely to the custom and program of annual work as defined by this Association, and it is noteworthy that many of the annual reports are valuable additions to pharmaceutic literature. We also place on record a roster of Pharmacy Boards and State Pharmaceutical Associations as follows :

PHARMACY BOARDS.

State.	Pharmacy Board founded	Present law was passed
Alabama	1886.	Feb'y 27, 1887.
Alaska	No reply.	
Arizona	No reply.	
Arkansas.....	May 8, 1891.	March 13, 1891.
California	March, 1891.	March 15, 1901.
Colorado	May 24, 1887.	April 18, 1893.
Connecticut	June, 1881.	March, 1881.
Delaware	April 14, 1887.	
District of Columbia. By Act of Con- gress	1878.	June, 1878.
Florida	May 30, 1889.	May 30, 1889.
Georgia	1875.	Sept. 27, 1881.
Idaho	No reply.	
Illinois	May 30, 1881.	July 1, 1901.
Indiana	May 2, 1899.	March 1, 1899.
Indian Territory.....	No reply.	
Iowa	April 23, 1880.	March 22, 1880.
Kansas	May 7, 1885.	March 5, 1885.
Kentucky	1874.	March 6, 1898.
Louisiana	Oct. 17, 1888.	July 11, 1888.
Maine	Feb. 9, 1877.	March 16, 1899.
Maryland	May 1, 1902.	April 8, 1902.
Massachusetts.....	1885.	June 11, 1885.
Michigan.....	1885.	1885.
Minnesota	March, 1885.	March 4, 1885.
Mississippi	1892.	January, 1892.
Missouri.		
Montana.		
Nebraska	1887.	March, 1887.
Nevada	May 6, 1901.	March 28, 1901.
New Hampshire	1875.	July, 1875.
New Jersey.....	1877.	March 19, 1877.
New Mexico.....	April 10, 1889.	Feb. 15, 1899.
New York (State Board of Pharmacy of State of N. Y., successor of the former N. Y. City Board founded 1871; Erie County, 1884; N. Y. State Board, 1884)	January 1, 1901.	April, 1900.
North Carolina.....	June 1, 1881.	March, 1881.
North Dakota	July, 1887.	March, 1890.
Ohio	March, 1884.	April 21, 1898.
Oklahoma. .		
Oregon	1891.	January, 1891.
Pennsylvania	January 25, 1887.	May 23, 1887.
Rhode Island	June 17, 1870.	March 31, 1870.
South Carolina.....	March, 1876.	March 10, 1876.
South Dakota.....	January, 1893.	January, 1893.
Tennessee	No reply.	

Texas.....No reply.
 UtahNo reply.
 VermontNo reply.
 Virginia..... No reply.
 WashingtonNo reply.
 West Virginia.....No reply.
 WisconsinNo reply.
 WyomingNo reply.

PHARMACEUTICAL ASSOCIATIONS.

State.	Organized.
Alabama	May 10, 1892.
Alaska	No association.
Arizona	No association.
Arkansas	May 30, 1883. Inc. August 5, 1889.
California.	
Colorado.	
Connecticut	February 9, 1876.
Delaware	May, 1887.
District of Columbia.....	November, 1897.
Florida	No association.
Georgia	1875.
Idaho	No association.
Illinois.	
Indiana	May, 1882.
Indian Territory	May, 1893.
Iowa	February 10, 1880.
Kansas	May 23, 1880.
Kentucky	June, 1878.
Louisiana	April 24, 1882.
Maine	July 23, 1867.
Maryland	November, 1889.
Massachusetts	April, 1882.
Michigan	July, 1887.
Minnesota	October, 1883.
Mississippi	No association.
Missouri	October 29, 1879.
Montana.....	July, 1890.
Nebraska.	
Nevada	No association.
New Hampshire	January 22, 1874.
New Jersey	February, 1870.
New Mexico.	
New York	May 21, 1879.
North Carolina	August 12, 1879.
North Dakota.	
Ohio	August, 1879.
Oklahoma	August, 1890.
Oregon	June 10, 1890.
Pennsylvania.	
Rhode Island.	

South Carolina	November, 1872. Inc. 1876.
South Dakota	January, 1893.
Tennessee	August, 1886.
Texas	May, 1879.
Utah.	
Vermont.	
Virginia	May, 1882.
Washington	January 29, 1890.
West Virginia.	
Wisconsin	June or July, 1880.
Wyoming	No association.

We may here recall the names of some of the illustrious men who made a record well deserving a place in this paper: Charles T. Carney, Samuel L. Colcord, George F. H. Markoe, Charles A. Tufts, E. R. Squibb, P. W. Bedford, William Proctor, Jr., Edward Parrish, John M. Maisch, Israel J. Grahame, Elias Durand, an honorary member, Alfred B. Taylor, Charles Bullock, Joseph Laidley, E. S. Wayne, W. Silver Thompson, Ferris Bringhurst, Charles A. Heinitsh, Charles Rice, W. Scott Thompson. Joseph Laidley and Ferris Bringhurst lost their lives by accident in pursuit of their profession, the former through a gunpowder explosion, the latter whilst manufacturing oxygen gas.

The roll is a long and honorable one; we cannot name them all, as this is not to be a memoriam roster, but will serve to fix the characters who each in their sphere were more or less identified with the progress of the science. Most of those named have contributed largely to our work by word and pen, and here let it be recorded we are passing in review the acts of men who have rounded their lives: the work of the living we dare not embody in this paper; the worthy men of to-day are legion, but they not having finished their course, will be better subjects for the next jubilee papers, should they continue to do well.

I recall, with great satisfaction, a meeting in Baltimore when the subject of Rhubarb was considered, and Dr. E. R. Squibb, with his natural, painstaking care, enlightened the Association with most instructive information, and during the discussion, about all that could be said on the subject was there given.

Mr. Charles T. Carney's report on Home Adulteration, who with a committee of five others, one alone of the six surviving (our honored pioneer friend, Alpheus Phineas Sharp, of Baltimore), will ever recall the beginning of conscientious effort to make unpopular substitution, sophistication and adulteration of drugs, medicines and culinary articles.

Almost contemporary with the organization of this Association the process of displacement or percolation was advanced. It was not originated by pharmacists so far as we are advised. We are informed in Holy Writ of the probability of utilizing wood ashes in leaching alkali, as they also used soap in that period. The process is an old one, and the application

of the art has had various stages of elegance. Edward Parrish notes the French coffee-pot principle applied by the eminent firm of French pharmacists H. Boullay & Sons. Their work was fully corroborated, elaborated and practically applied, as given in a paper, "An original communication on Boullay's filter and system of displacement, with observations drawn from experience," wherein proper recognition is given to the principle, of the Cafetière de Dubelloy (the French Coffee-Pot), Real's filter press, the long adapter of Mr. Robiquet, experiments of Mr. Guillermond, the work of Elias Durand, Mr. Emile Mouchon, an apothecary of Lyons, France, and Mr. Hany, Jr. We cannot give credit to these men as inventors of the art; at no time since the advent of the wood ash lye percolating tub or hopper has there been so much care bestowed in its application as has been since the work of Procter, Parrish, Duhamel, Israel J. Grahame, followed by Dr. E. R. Squibb, who became a specialist and eminently qualified as a collaborator with those named in developing still further the process of repercolation, which we presume will ever remain a memorial of his skill and genius.

We make this comparison: Do you remember—some do, we know—when the proper way to make the old-time tinctures was to bruise the ingredients, place them into the shop bottle, agitate vigorously for a while the first few days, and then an especial duty was enjoined upon some one every Monday morning, so long as anything remained in the bottle, to shake the bottles from one end of the shelf to the other, decanting as wanted until the dregs were reached, and if the bottle capacity would allow, fresh portions were put with the old.

We must emphasize percolation marks a great advance. Just forty years ago we merged from the old to the new on a line of preparations which fixes a point in pharmaceutical history noting a very decided advance in the manufacture of suppositories; the soap suppository had served its day and mixtures of wax and solid fats had also to be discarded to keep in line with the improvement; to the late Alfred B. Taylor, a retail pharmacist, an active member and first Secretary of this Association, we owe the use of butter of cacao as a suppository base, and all the pharmaceutical world has learned to value this important subject. We doubt whether there is any preparation of the Pharmacopœia in which the revolution has been so complete. Other vehicles are used in some form of suppositories. Gelatin, sodium stearate, also mark advances in the time under review, but no one person has performed such a specific service as did Mr. Taylor in promulgating cacao butter as a suppository base. Let me quote a paragraph from U. S. Dispensatory, 1854:

"Their form may be cylindrical, conical or spherical. They should be of such a consistence as to retain their shape, but so soft as to incur no risk of wounding the rectum. It may be from one to three inches long and about as thick as a common candle. Soap is not unfrequently employed

for this purpose—a piece of solidified molasses (molasses candy) is sometimes preferred.” Reference is then made to the work of Alfred B. Taylor, in *Am. Journ. Pharm.*, Vol. 24, p. 211.

Fluid extracts must hold a place specifically American, and the preparation and popular use of this class marks the work of our period; and whilst we can make no special claim to a discovery, we place on record the fact that we owe much, if not all, for the excellence in this line, to two most earnest retail pharmacists, the distinguished and honored William Procter, Jr., and Israel J. Grahame; the latter during his best days, and before physical infirmity assailed him, was a good type of an intelligent, honest and industrious pharmacist. Dr. E. R. Squibb's masterful work on a larger scale was made possible by their prior labor and research.

We all remember with what diligence Prof. John M. Maisch made preparation for our annual meetings, for many years our Permanent Secretary, and yet with all other labor, our proceedings show that his contributions to the advance of pharmacy are most valuable, as well as voluminous.

Of another great promoter of the art who in his day contributed largely in developing pharmacy—Prof. Edward Parrish, a physician just rounding his 50th year of active practice—Dr. Wm. M. Guilford, of Pennsylvania, writes: “Edward Parrish lectured to medical students whilst we were students in the old University of Pennsylvania, at hours which did not interfere with our regular hours at the college; he not only lectured, but put us to the practical work, writing and compounding prescriptions in his own laboratory, Eighth and Arch streets. He was much beloved by his incipient M. D.'s, who will never forget his kindly face, his patience and earnestness. The practical value of his teaching was best appreciated by many physicians in after years, while in active practice.” It will be remembered that Prof. Parrish succeeded Prof. Procter in his work of instructing students of pharmacy on a larger scale at a later date.

We note a very conspicuous advance, and well deserving a place in this paper, as we compare drug-store and laboratory glassware. Go to our exhibition hall; note the former-day shop-bottles, ointment-containers, prescription vials and bottles; compare with the neatly-finished glassware of to-day; put them side by side with the ware of that day, run the eye along the line from the minute gramme vial to the huge glass container with capacity of thirty and more gallons, and note also with special critical eye the absolutely perfect finish in every detail. This is, in a large measure, due to the encouragement of this Association. I may simply recall an incident at one of our meetings held in Louisville, Kentucky, when a representative of one of our leading glassware manufacturers took special pains to obtain such points, by interviewing our members, that would enable his firm to perfect the lip of the prescription bottle. The growing want of the laboratory and dispensing store for glassware during our history the safely defines conditions and now.

Elegance and excellence in pharmacy, as compared with former days, are significant landmarks. We refer especially to pills, round in form or compressed, elixirs and plasters. The pharmacist cannot lay claim to invention in the matter of sugar-coating pills ; it, like percolation, has been borrowed to apply in the advances and development of our art—we have always been clever enough to know a good thing when we see it, and how to apply the improvement if it serves our purpose so to do.

As a representative of the retail branch of the profession, and with great deference to the skill and labor of wholesale manufacturers, I cannot pass unnoticed the fact that most of these advances have developed behind the counter and in the laboratory of the retail pharmacist.

They were worthy men who had a part in this development, whose portraiture has been presented to you in retrospect, and who have established landmarks. Dare we say they have lived in vain? We may say only they have gone before and they still live in their deeds, and, though dead, their labor bears testimony to-day. Some of us are a generation younger ; and by far the larger membership to-day, comparatively younger by several decades, may view this honor-roll and find in the men and their characters an example worthy of emulation. It is well believed that in the providence of God the evangelization of the millions in heathendom must be accomplished by personal contact, through education as the current of a new life ; so may we well and properly conclude that the development of our profession for the past fifty years has been accomplished largely by the personal influence, the unflagging integrity and career of usefulness of the men that constitute this tribute, defining the status and landmarks of American pharmacy.

PHILIPPINES.

(*Our latest information.*)

Pharmaceutic Faculty, University of Santo Tomas de Manila.

Session opens about the first of July ; matriculates 1896-97, 51.

Course, among others, practical and comparative pharmacy, inorganic pharmaceutic chemistry, organic pharmaceutic chemistry, pharmaceutic physics.

Faculty—professors, 7 ; instructors, 1.

Organized—As early as June 8, 1585, Philip II gave orders for the founding of a university in the Philippines. In 1601 the “Seminario de Nobles” was opened, and on April 8, 1611, the Dominican Order established the College of Santo Tomas for the instruction of the natives and the care of the Spanish poor, which received royal sanction July 16, 1628. The university was founded by royal decree October 29, 1857. The Dominican Order appoints the theological professors ; the governor-general the others.

CUBA.

Pharmaceutical Faculty, Havana University.

Session opens 1-0-99; matriculates 1895, 219; matriculates 1899, 98.

Course, among others, history and bibliography of pharmacy, pharmaceutical practice.

Faculty—professors, 4.

Organized 1721 by charter of Pope Innocent XIII, conferring on the Dominican Order San Juan de Letran the right to found a university in Havana and to confer academic degrees. Right confirmed by royal decree September 28, 1728, and university opened in the monastery. In 1842 removed to monastery of San Domingo and secularized. Cornerstone of new building laid in 1884.

THE PRESIDENT: The arrangements for this semi-centennial celebration have been in the hands of a committee, under the chairmanship of Mr. George M. Beringer. The success of the work is testified to by the occasion that we are about to close. In spite of the work on hand, this enterprising and energetic chairman has found time to consult the Muses, and I will call upon Mr. Beringer to read an ode to the founders of the American Pharmaceutical Association.

Mr. Beringer arose and read the following, which was received with favor by his audience and generously applauded:

AN ODE—TO THE FOUNDERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

BY GEORGE M. BERINGER, A. M., PH. G.

Thrice welcome day, all hail to thee;
We salute thee, pharmacy's jubilee.
The sands of time are flowing fast,
The fiftieth mile will soon be past.
Yet, ere we take the final forward stride
That "this" into history of "the was" doth glide,
In meditative mood we pause
And backward gaze and muse.
From the spring that perpetual flows
The source unknown no eye discloses;
'Tis memory's own, she controls, she draws
Such copious recollection showers
And dashes the remembrance o'er us.

Our retrospect, a vision clear,
Five great stone arches do appear;
Each span a decade, marketh here
The last just completed with this year.
Now half way o'er a century's stream
A noble work accomplished it doth seem.
In the distance, still bright to view,
Is the first boulder stone laid firm and true;
Carved its face indelible, eighteen fifty-two

Our model ever, we finish nineteen two.
For hopes spring amid ambition's glow,
Just as they did fifty years ago.

No worship of the heroes of war and strife
Is nobler than praise of deeds of peaceful life.
Pioneers these, who achieved in science and in art;
Progress their watchword, faithful toil their part,
Their labors so perfect, their works so pure,
Bright examples gleam as from God's azure.
In the gladness of our golden jubilee
We extend the praises of all pharmacy
To the art and sciences, the early devotee.
Recalled by memory's fantastic flight,
We see their forms, their faces bright;
E'en their voices from these walls resound,
Though now with our tributes they abound.

Each year earnest pilgrims to their shrine,
Add new efforts and extend the line.
With added strength the later arches wider
Each the progress of its age, the bold recorder.
The ever-living words of the immortal Procter
Cement the masonry—needs no other mortar.
“On virtue we must in our actions stand,
Or our Association might as well disband.”

The sun, slowly rising, dispels the gloom,
And early morn proclaims to man and bloom.
Then, higher rising, bursts forth in full power—
The perfect day demands the perfect flower.
The past, the present, now are ours
To shape and mold for future powers.
Duty calls for builders to the line,
Pharmacy, unexhausted field and mine,
Demands new energies in the fight
And strenuous labors for the right.
To the future, the present must our heritage
Transmit with greatly added store and page.

The President announced that a few minutes yet remained of the time allotted to this session, and extended the opportunity for a few informal remarks suited to the occasion.

Mr. W. C. Alpers, of New York, arose and said :

Mr. President, Ladies and Gentlemen : I trust it will not appear presumptuous, after the able addresses we have heard, if I beg the privilege of the floor for a few minutes—not because there is any necessity or urgency for it, but merely following the impulse of a grateful heart.

I think there are two sentiments that should be expressed here before we close our Jubilee meeting. The first is to pay a tribute to the memory of one of our ex-presidents, whose name appears on the last page of our last program, but who is not with us to-day. I refer to William Scott Thompson. Of all the pharmacists in the Union

whose acquaintance I have made at the meetings of this Association I have valued that of none of them more highly than Mr. Thompson's. It is true there are many men among us who exceeded Mr. Thompson in learning, who were more eloquent than he, who accumulated more wealth than he, or who had more influence in the outside world than he; but when it comes to the real toil and labor of pharmacy, when it comes to being a true representative of pharmacy, I say Mr. Thompson was the peer of us all. [Applause.] It is more than conventional praise if I say we miss him. We miss his advice in the arguments of the Council, we miss it in the debates of the Association; we miss his pleasant smile and his bright eye in the social phases of our meetings. You remember, those of you who knew him even better than I did, what an influence—what a powerful influence—he had in shaping the destiny of American pharmacy. Well do I remember one instance that occurred in the city of Richmond when we met there two years ago. A committee of commercial men came before us to get us to endorse some scheme or idea they were interested in—I do not recall the exact character of it now—and they made able addresses before the Association; and if a vote had been taken at that time I am sure there would have been practically no dissent from their view of the matter. But Mr. Thompson arose and addressed the meeting. He was not eloquent, and he spoke very quietly; but he spoke to our hearts and minds, and he touched us. He showed us which way our interest lay. After he had spoken for a few moments, the whole meeting was ready to adopt his view of the matter, and did so upon a vote being taken, and directly against the sentiment of the minute before. At that moment it struck me what a great influence one man can sometimes have. I asked the question then, and I ask it now, why that man had such an influence over us. It was because when he spoke to us we felt that a man of honor spoke, that a man of character addressed us; and we listened and followed his advice. I met Mr. Thompson only a few times, comparatively—only at the meetings of the Association once a year; but from the moment I made his acquaintance I was drawn to him. I do not know whether he shared my sentiments, but I think he did. There is sometimes between men a feeling we do not care to express, though each reciprocates the feeling of the other, and I know this feeling was shared by many of you with respect to our departed friend. I believe that everything that Mr. Thompson did, everything he said, was in the true interest of pharmacy. American pharmacy lost in William Scott Thompson her greatest friend, her greatest admirer. It is easy to write the history of men who go forth to fight great battles and win great victories—as the world counts them; but it is far more difficult to write the history of those who work for the good of others in the quiet of the laboratory or the shop, all unknown to the world. I wish a historian could be found to write the life of our great pharmacists, and particularly the life and character and deeds of Mr. Thompson. I am sure that when time passes on, and the deeds of pharmacists are better known, and there is written a history of the men of our profession, there will not be omitted the name of William Scott Thompson. [Applause.]

Mr. Chairman, there is another sentiment to which I would like to devote a few moments, though it may come like a feeble and distant echo after the eloquent words we have heard. I feel we should not leave this hall without expressing our sincere thanks to our veteran ex-presidents who are with us to-day. This is a privilege we are enjoying to-day that will never come to us again. We see around us here men we have honored in the highest manner we could—not because they sought it, but because we believed them worthy, and liked and admired them. Now, in the nature of every man there are certain predilections, certain tendencies to find recreation. As I have heretofore had occasion to say before this Association, I always find recreation from the cares and turmoils of business in reading history; and often in the midst of business, or at night when I retire and do not know how to begin the next day, I have taken up the life of some great man—a poet maybe, or a reformer, or a great civilizer, or a statesman;

a Luther, a Franklin, a Webster—and have felt refreshed and benefited and strengthened for renewal of the struggle of life. The lives of such men have always appealed to me much more forcibly than the life of an Alexander or a Napoleon, whose very names suggest murder and destruction. Now, in the great names of history we rarely find that of a pharmacist. Can it be that we have had no great men? Not so, I say. To become a great pharmacist requires more of the elements of real greatness than almost any other art or profession. The arduous labors to which we are subjected, the toil that accompanies us from morning until night, makes it so difficult for us to rise above our fellows and earn the attribute of greatness. Now I say, if the reading of the lives of great men is such a recreation to us, how much more should we enjoy the presence of men whom we have delighted to honor for their attainments? Therefore, Mr. President, I think we should give these gentlemen with us here to-day—these honored ex-presidents of the Association—a vote of sincere thanks for their presence among us. I feel that I voice the sentiments of all when I say, we thank you, gentlemen, with all our hearts. [Applause.]

MR. SHEPPARD: Mr. President, fifty years ago the American Pharmaceutical Association was born here at the home of the Philadelphia College of Pharmacy. We are now holding our semi-centennial in the home of the same institution. Now I want to move that the thanks of the American Pharmaceutical Association be most warmly extended to the trustees of the Philadelphia College of Pharmacy for their courtesy in this matter.

MR. HYNSON: Mr. President, it is my great pleasure to second the motion of our Treasurer.

The motion was put to a vote and carried unanimously.

MR. SCHIEFFELIN: I would like to move the adoption of the following resolution:

Resolved, That the Secretary be requested to express to Dr. Frederick Hoffmann the deep regret which the American Pharmaceutical Association feels at his absence from the fiftieth anniversary meeting; its earnest hope that his health may be speedily restored, and its hearty thanks for the valuable paper he contributed.

The resolution was adopted unanimously.

Mr. H. B. French, President of the Philadelphia College of Pharmacy, was here introduced by the Chair, and courteously invited the members and the ladies present to an inspection of the college building in its various departments—its laboratories, class rooms, etc.

The Golden Jubilee Meeting of the Association was declared at an end, and the Association then adjourned.

EIGHTH SESSION—FRIDAY MORNING, SEPT. 12, 1902.

No business was transacted before the first session of the Section on Practical Pharmacy and Dispensing.

NINTH SESSION—FRIDAY EVENING, SEPT. 12, 1902.

No business was transacted before the second session of the Section on Practical Pharmacy and Dispensing.

TENTH SESSION—SATURDAY MORNING, SEPT. 13, 1902.

No business was transacted before the first session of the Section on Education and Legislation.

ELEVENTH SESSION—MONDAY MORNING, SEPT. 15, 1902.

No business was transacted before the second session of the Section on Education and Legislation.

TWELFTH SESSION—MONDAY AFTERNOON, SEPT. 15, 1902.

The twelfth session was called to order at 3 : 10 p. m. in the convention hall of the Hotel Walton, by President Whelpley, who alluded to his exceptional privilege in calling to order the session which closed the annual meeting at the end of the fifth decade of the existence of the American Pharmaceutical Association.

The chair called on the Secretary to read the minutes of the second general session, which he did, down to the first recess taken by that session.

On motion of Mr. Searby, the minutes were ordered adopted as read.

The Secretary then read the minutes of the first adjourned (or recess) session of the second general session ; also of the second adjourned session of the same, which, on motion of Mr. Lowe, were adopted as read.

The Secretary said he presumed it would be proper also to read the minutes of the special Jubilee Session, held on Thursday afternoon, in which view the chair agreed, and the Secretary read the minutes, which, on motion, were adopted as read.

Mr. Kennedy, Secretary of the Council, was called upon to read the minutes of that body, and read those of the fifth, sixth, seventh and eighth sessions of the retiring Council, held at Philadelphia, and the first and second sessions of the new Council organized at this meeting.

FIFTH SESSION OF THE COUNCIL—SEPTEMBER 10, 1902.

The Council assembled at the Hotel Walton at 9 o'clock a. m., the following members being present: Messrs. Baker, Caspari, Cliffe, Diehl, Eberle, Kebler, Kennedy, Hopp, Rapelye, Searby, Sheppard, Whelpley and Chairman Prescott, who presided.

The Secretary of the Committee on Membership presented the names of nineteen applicants. On motion of S. A. D. Sheppard, the names read were directed to be referred to the Association with favorable recommendation.

On motion of Wm. M. Searby, seconded by Chas. Caspari, Jr., it was agreed that John Calvert, of San Francisco, Cal., be made a life member, old style, without the Proceedings.

It was moved by S. A. D. Sheppard and seconded by Chas. Caspari, Jr., that any person whose name appears on the list of life-members, old style, without the Proceedings, shall have the privilege of purchasing any volume of the Proceedings for two dollars and fifty cents. This motion was adopted.

On motion of H. M. Whelpley, seconded by Chas. A. Rapelye, it was agreed that, with the consent of the officers of the Section on Scientific Papers, the transfer of the time

allotted that section for a third session to the Section on Practical Pharmacy and Dispensing be approved.

C. A. Mayo appeared to make a report of the Special Committee on Journalizing the Proceedings, but was requested to report at the next session of the Council.

Chas. Caspari, Jr., stated that representatives of pharmaceutical journals had asked for copies of the stenographer's report of the various sessions of the Association and Council, and requested that some action be taken on the subject by the Council.

On motion of Chas. A. Rapelye, seconded by Wm. M. Searby, it was agreed that no copies of the stenographer's report should be furnished to any one.

On motion, Council adjourned to meet again to-morrow morning at 9 o'clock.

GEO. W. KENNEDY, *Secretary*.

SIXTH SESSION OF THE COUNCIL—SEPTEMBER 11, 1902.

The Council convened at the Hotel Walton at 9 o'clock a. m., with the following members in attendance: Alpers, Baker, Caspari, Diehl, Dohme, Eberle, Hopp, Kebler, Kennedy, Rapelye, Searby, Sheppard and Whelpley. In the absence of A. B. Prescott, the Chair, on motion of W. M. Searby, was occupied by H. M. Whelpley until the Chairman's arrival.

The minutes of the Fifth Session of the Council were read and adopted.

The Secretary of the Committee on Membership presented the names of fifteen applicants, which on motion of W. M. Searby were ordered to be presented to the Association with favorable recommendation.

The special committee on publication of the proceedings in journal form appeared by appointment and submitted the following majority and minority reports, which were read.

MINORITY REPORT OF THE SPECIAL COMMITTEE ON PUBLICATION OF THE PROCEEDINGS.

To the Members of the Council:

This Committee was appointed at the second general session to consider the recommendation contained in the report of J. W. T. Knox, Chairman of the Auxiliary Committee on Membership, that in lieu of the issuance of the annual volume of proceedings, the Association undertake the publication of a monthly journal.

This Committee was instructed to afford a public hearing on the subject, obtain all the information possible, and lay the results of this hearing and the information obtained before the Council. In pursuance of these instructions the public hearing was held at an adjourned general session last evening (Tuesday), when a dozen or more members expressed their views on the subject, the majority of those speaking being apparently in favor of the proposed change.

During the meeting it was stated for the information of the members, by members of the Committee, that a proposition had been received from Dr. Edward Kremers to turn over to the Association the Pharmaceutical Review with a view to making that journal the official organ of the Association. After publishing the journal for a year the Association may either return the Pharmaceutical Review to Dr. Kremers, or he will acquiesce in any arrangement which the Association might choose to make to retain the journal and continue its publication as the organ of the Association. It was also stated that it was proposed in the event of the establishment of an official journal that Mr. Caspari should become the editor, presumably receiving the same salary as editor which he now receives as Secretary. It was proposed to restrict the publication of the papers and the Proceedings (we believe) to the official organ, which was to be sent to every member of the Association in lieu of the Proceedings. It was proposed that news features should be introduced into the proposed organ, and that advertisements be solicited for it as is the custom in trade publications. It was stated that by counting in the sum now paid to the Secretary and to the reporter on the Progress of Pharmacy for their services and the annual cost entailed by the publication and delivery of the proceedings, the sum of \$3,400 would be available for use in the production of the official organ. After hearing the debate upon the subject, a summary of which we should be pleased to give verbally should the Council so desire, your Committee had an executive session, when it was found that upon vote there was a division of sentiment in the Committee, three members favoring the proposal and two being opposed. In consequence your Committee will submit both a majority and a minority report; the majority consisting of Messrs. Knox, Hynson and Searby favoring the proposal of Mr. Knox, and the minority consisting of the Chairman and of Mr. Sheppard, being opposed to the proposed change.

This report which we have the honor to submit is the report of the Minority Committee, which is of the

opinion that the establishment of an official organ for the Association as outlined by Mr. Knox would be a vital error on the part of the Association. While we realize that the affairs of the Association, particularly as regards the accretion of new members, are in a critical condition and that some measure should be taken to rescue it from that condition, the undersigned minority of the committee are firmly convinced that the adoption of the proposed plan, so far from being of benefit, would be a positively suicidal step on the part of the Association. The gentlemen proposing the plan, however firmly convinced they may be of its desirability, have not presented any statistics or data which upon careful analysis prove conclusively that the establishment of such an organ would even probably serve the purpose of bringing in new members under the conditions now existing in pharmacy. The financial responsibility entailed in the adoption of this plan is much more grave than would appear upon a superficial examination, for it is a responsibility which if once taken up cannot easily be laid down; and while the proposition has been made that a journal should be undertaken for one year, without necessarily pledging the Association to its continuance, it must be apparent to every one that if the publication of such a journal is once undertaken by the Association it cannot be abandoned, short of absolute ruin of the Association financially. The undersigned minority of your committee therefore vigorously protest to the Council against the adoption of the proposed foundation of an official organ, as a step inviting certain and imminent disaster to the Association.

Respectfully submitted,
Philadelphia, Sept. 10, 1902.

CASWELL A. MAYO, *Chairman*,
SAM'L A. D. SHEPPARD.

MAJORITY REPORT OF THE SPECIAL COMMITTEE ON PUBLICATION OF PROCEEDINGS.

To the Honorable Council of the American Pharmaceutical Association :

The majority members of the Committee appointed by President Whelpley to consider the recommendations of the chairman of the Auxiliary Membership Committee, in accordance with a resolution passed in general session, beg leave, as instructed, to submit the following for your help and guidance:

Speaking for ourselves, we hope to be pardoned for stating that two of us have given this matter of the publication of the proceedings of the Association in the form of a monthly journal, in accordance with the recommendation under consideration, most serious thought for the last several years, and all have given it intense painstaking consideration since our appointment.

Our conclusions therefore are based upon and influenced by careful investigation and thought, but most largely by the expressions heard from many and varied classes of members in open session, where the subject was most thoroughly and dispassionately discussed.

As tersely as possible, we would state our conclusions as follows:

1. That the number of members of this Association is in no proper degree proportionate to the number of persons in this country whom it seeks to benefit.
2. That a very large percentage of those who are induced to join the Association, not finding it attractive or helpful, relinquish their membership within a few years after their entrance.
3. That something should be done to secure and maintain a membership creditable in proportion to the number of persons eligible to membership.
4. That so far as we can discover, the very large majority, if not all, of kindred societies, that have a large membership and are successful, have discarded the form of publication that this Association employs, and publish their proceedings in journal style, periodically issued in connection with other acceptable and consistent matter.
5. That the facts, that on an average less than 20 per cent. of our members attend our meetings and that the remaining 80 per cent. needs to be dealt with in a manner which will more thoroughly interest and more surely remunerate them, suggest the journal idea as probably the best means of meeting this requirement and for keeping them in touch with the doings of the Association.
6. That a journal will be useful and helpful as the means of communicating notices, news and the doings of the Council *ad interim*, and be made the means of extending the influence of the Association.

Regarding the feasibility of the change, we submit the following:

1. That it, like every new enterprise, must of necessity be in the line of an experiment.
2. With regard to the cost as compared with the present form, we cannot give specific figures. We believe, however, if the increase in membership by the change be as great as we may reasonably expect (basing our expectations upon the increase secured to other associations through the same means), that the additional cost will be far less than the benefits accruing.
3. That the journal can be made to conform in size and style to the present proceedings, so as to make its binding each year possible, thereby continuing the set of reference books, and preventing a break in the set, should the journal at any time be abandoned, and the present form resumed.

Taking everything into consideration, we believe the change should be made, and respectfully advise your favorable action upon the recommendations.

Respectfully submitted,

HV. P. HYNSON,
J. W. T. KNOX,
W. M. SEARBY.

Wm. M. Searby moved, seconded by Chas. Caspari, Jr., that the majority report in favor of journalizing the Proceedings be adopted, which led to spirited discussion of the reports by Messrs. Baker, Caspari, Diehl, Dohme, Hopp, Prescott, Rapelye, Searby and Whelpley, and by courtesy Mess. Ebert, Hynson and Mayo.

On motion, further discussion of the subject was postponed until the next session of Council, and it was agreed that all persons who desired to be heard be requested to appear before the committee in open session to give free expression to their views.

It was moved by Chas. Caspari, Jr., and seconded by W. C. Alpers, that the Committee on Publication be instructed to have 100 or 150 copies of the Report on the Progress of Pharmacy printed for the use of the Committee on Membership. This motion was adopted.

On motion, the Council adjourned.

GEO. W. KENNEDY, *Secretary*.

SEVENTH SESSION OF THE COUNCIL—SEPTEMBER 12, 1902.

The Council was called to order at the Hotel Walton at 9 o'clock a. m., by Chairman Prescott, with the following members present: Alpers, Baker, Diehl, Eberle, Kennedy, Rapelye, Sheppard and Whelpley.

The minutes of the Sixth Session of Council were read and adopted.

The Secretary of the Committee on Membership reported the names of five applicants. On motion of Chas. A. Rapelye the gentlemen named were directed to be recommended to the Association for membership.

On motion, the Council adjourned.

GEO. W. KENNEDY, *Secretary*.

EIGHTH SESSION OF THE COUNCIL—SEPTEMBER 13, 1902.

The Council was convened at the Hotel Walton, at 9 o'clock a. m., by Chairman Prescott, the following members being present: Baker, Beal, Caspari, Diehl, Dohme, Kebler, Kennedy, Lowe, Rapelye, Sheppard and Whelpley.

The minutes of the seventh session were read and adopted.

Chas. Caspari, Jr., presented a communication from J. O. Schlotterbeck, asking for an appropriation of \$30.00 to defray the expense of procuring engraved plates of drawings to accompany his paper on the Structure of the Seed of *Stylophorum Diphyllum*.

On motion of Geo. W. Kennedy, the expenditure was authorized.

On motion of S. A. D. Sheppard, seconded by Geo. W. Kennedy, Herman J. Lohmann was re-instated to full membership, having paid up all his back dues.

It was moved by S. A. D. Sheppard, and seconded by H. M. Whelpley, that, whenever in the judgment of the President, General Secretary and Treasurer, it appears advisable to do so, the dues of any authorized agent may be remitted.

This motion was adopted.

The Secretary of the Committee on membership presented the names of applicants, which, on motion of C. B. Lowe, were ordered to be referred to the Association with favorable recommendation.

On motion of H. M. Whelpley, a paper presented by V. E. Silverburg, of Indiana, and entitled, "The Other Fellow's Drug Store," was referred to the Section on Education and Legislation.

Chas. A. Rapelye moved, seconded by G. W. Kennedy, that the subject of publishing the Proceedings in journal form be continued until next year.

This motion was adopted.

On motion of H. M. Whelpley, seconded by C. B. Lowe, the Committee on Publication was directed to have prepared a complete index to the first 50 volumes of Proceedings, and to submit the same in manuscript form, together with estimates for the expense of printing the same in one volume, at the next annual meeting.

It was moved by Chas. Caspari, Jr., and seconded by S. A. D. Sheppard, that the sum of three hundred dollars, or as much thereof as may be necessary, be appropriated for the purpose of defraying the expense of compiling the collective index for fifty years.

This motion was adopted.

On motion of C. B. Lowe, seconded by G. W. Kennedy, the Committee on Publication was instructed to insert the portraits of the past and present officers of the Association and the sections in the 1902 volume of Proceedings.

It was moved by Chas. A. Rapelye, seconded by C. B. Lowe, that a committee of three, composed of Messrs. A. B. Prescott, J. P. Remington and C. Lewis Diehl be appointed for the purpose of soliciting funds from the friends of the Association to form an endowment fund for publication and other purposes, and that A. B. Prescott be made Chairman and J. P. Remington Secretary of said committee. This motion was adopted.

S. A. D. Sheppard moved, seconded by H. M. Whelpley, that the following amendment to the by-laws, recommended by the Chairman of the Committee on Membership, be adopted:

Amend Article I of Chapter VII, by striking out all after the word "provided" in the sixth line and inserting in place thereof the following: "That any person whose name has been dropped from the roll of membership for non-payment of dues shall be re-admitted only after having again made application in regular form—the application being accompanied by the usual fee—and shall also have made an additional payment of five dollars, for which he shall not be entitled to any volumes of the Proceedings. This motion was adopted.

Chas. E. Dohme presented the following from the Committee on Finance:

The money of the Association known as the General Fund has been heretofore invested in bonds of the American Investment Co., of Washington, D. C. These bonds have now been called in, and the money is in the hands of the Chairman of the Council. It is recommended by the Finance Committee that as said money was part of treasury cash of the Association, it be again turned over to the Treasurer, for the present, and be deposited in bank and invested at the discretion of the Finance Committee.

CHARLES E. DOHME,
CHAS. A. RAPELYE,
CLEMENT B. LOWE.

On motion of Chas. E. Dohme, seconded by G. W. Kennedy, the recommendation of the committee was adopted.

On motion, the Council adjourned.

GEO. W. KENNEDY, *Secretary*.

FIRST SESSION OF THE NEW COUNCIL—SEPTEMBER 13, 1902.

The new Council assembled for the purpose of re-organization, with the following members present: Messrs. Baker, Beal, Caspari, Diehl, Eberle, Kennedy, Lowe, Rapelye, Sheppard and Whelpley.

Temporary organization was effected by the election of A. B. Prescott and Geo. W. Kennedy, as Chairman and Secretary respectively.

The Chairman stated that the first business in order would be the election of officers.

C. B. Lowe nominated Jas. H. Beal for Chairman. On motion, the nominations were closed and the Secretary cast an affirmative ballot for his election, in compliance with instruction, when the chair announced the election of Jas. H. Beal as Chairman.

L. C. Hopp was nominated for Vice-Chairman by Chas. A. Rapelye. On motion, the nominations were closed, and L. C. Hopp was elected Vice-Chairman by the Secretary casting an affirmative ballot as requested.

C. Lewis Diehl nominated Geo. W. Kennedy for Secretary. The nominations were closed, and Geo. W. Kennedy was elected Secretary by the Chair casting an affirmative vote as directed.

Chairman Beal thanked the Council in a few well-chosen remarks for the honor conferred.

On motion of Chas. Caspari, Jr., duly seconded, the Chairman was instructed to make up a list of committees and report at the next meeting of Council.

On motion, Council adjourned.

GEO. W. KENNEDY, *Secretary*.

SECOND SESSION OF THE NEW COUNCIL—SEPTEMBER 15, 1902.

The Council was called to order in the Hotel Walton at 9:30 o'clock a. m., by Chairman Beal, with the following members present: Messrs. Beringer, Caspari, Kennedy, Lowe, Payne, Patton, Rapelye, Sheppard and Whelpley.

The minutes of the first session were read and adopted.

The Secretary of the Committee on Membership presented the names of five applicants, which, on motion, were referred to the Association with favorable recommendation.

The Chairman having submitted a list of the proposed committees, as requested at the last session, the following Committee on Membership was on motion of J. F. Patton elected by the Secretary casting an affirmative vote:

H. M. Whelpley, L. C. Hopp, E. G. Eberle, W. L. Cliffe, T. V. Wooten, G. M. Beringer, J. W. T. Knox, and the Treasurer and General Secretary as *ex-officio* members.

On motion of L. C. Hopp the following Committee on Finance was elected by the Secretary casting an affirmative ballot:

Chas. A. Rapelye, C. B. Lowe and J. F. Patton.

On motion of L. C. Hopp the following Committee on Publication was elected by the Secretary casting an affirmative ballot:

Chas. Caspari, Jr., C. Lewis Diehl, W. C. Alpers, J. O. Schlotterbeck and C. S. N. Hallberg.

The Committee on Centennial Fund being provided for in the By-laws, is composed as follows:

Geo. F. Payne, Chas. A. Rapelye and Chas. Caspari, Jr.

The Chairman appointed the following Auditing Committee:

C. B. Lowe, Chas. W. Hancock and Wm. McIntyre.

On motion of Jno. F. Patton, the Secretary was directed to cast an affirmative ballot for the election of the following members of the Committee on Transportation:

A. E. Ebert, Chicago, Ill., C. A. Mayo, New York, N. Y., C. M. Ford, Denver, Colo., C. G. Merrell, Cincinnati, O., S. A. D. Sheppard, Boston, Mass., W. S. Elkin, Atlanta, Ga., H. M. Whelpley, St. Louis, Mo., Wm. M. Searby, San Francisco, Cal., W. A. Frost, St. Paul, Minn., Max Samson, New Orleans, La., Chas. Caspari, Jr., Baltimore.

On motion of H. M. Whelpley the President was authorized to appoint a special committee on transportation in cities not already named.

On motion of G. W. Kennedy, Council took a recess of five minutes to give the various committees time to select their chairmen.

On re-assembling the committees announced the following chairmen:

Committee on Membership—Lewis C. Hopp and Geo. W. Kennedy, *Secretary*.

Committee on Finance—Chas. A. Rapelye.

Committee on Publication—Chas. Caspari, Jr.

Committee on Centennial Fund—Geo. F. Payne.

Committee on Transportation—Chas. Caspari, Jr.

Auditing Committee—C. B. Lowe.

Chas. A. Rapelye moved that D. E. Prall, of Saginaw, Mich., be requested to serve as Local Secretary for the next annual meeting, which was adopted.

H. M. Whelpley moved that, in view of the fact that a number of foreign gentlemen, who had been invited to be present at this jubilee meeting had sent letters of regret, the Committee on Publication be instructed to make such selections from these letters as they may deem necessary for publication in the Proceedings. This was adopted.

On motion of Chas. Caspari, Jr., duly seconded, it was ordered that the language of

the invitation to complete membership be changed as follows: Strike out the words "you were elected a member under the provision of the By-Laws," and insert in place thereof "your application for membership was approved and the undersigned was instructed to invite you to complete your;" strike out "600 to 700" and insert in place thereof "1000;" strike out "electing" and insert in place thereof "inviting;" strike out "a member" and insert in place thereof "to membership;" strike out "of distinction and merit as would be a credit to the Association" and insert in place thereof, "and others as take an interest in the advance and success of American pharmacy."

L. C. Hopp moved that the report of the Committee on Membership be referred to the new committee on membership with the request that they give consideration to the recommendation relating to the circular to be sent to colleges of pharmacy. This was adopted.

On motion, the Council adjourned to meet at the call of the Chair.

GEO. W. KENNEDY, *Secretary*.

Mr. Hancock moved that the minutes be approved as read, and it was so ordered.

Mr. Kennedy read a list of 50 additional names proposed for membership, bringing the total for this meeting up to 280. Mr. Kennedy stated in this connection that an unprecedented thing had occurred, viz.: that 250 out of the 280 applicants, or about 90 per cent., had already paid in their first annual dues, which passed into the treasury the sum of \$1250.00. The statement was greeted with applause:

Mr. Kennedy then, on the eve of departure, took occasion to say:

I want to thank the gentlemen present for the time given me in which to read my minutes. I appreciate it very much. I am very glad to have met you all on this occasion, which has been a very interesting meeting—one of the best that I ever attended. It is certainly the best for new members. I hope to meet you all at Mackinac, Michigan, next year, and I will now bid you good-bye.

THE PRESIDENT: Our Secretary of the Council will, in a few moments, fold his tent and silently steal away, but a motion is now in order to invite the parties whose names have just been read to become members of this Association.

Mr. Lowe, seconded by Mr. Kline, so moved, and the motion was put and carried.

THE PRESIDENT: The General Secretary has in his hands credentials from the American Medical Association appointing Dr. Frank Woodbury, of Philadelphia, as a delegate to this Association. I am sure we shall be glad to hear from Dr. Woodbury.

DR. WOODBURY: Mr. President and Gentlemen, an apology is due for my appearance at this eleventh hour, but I think the explanation I will give will make the matter clear. Owing to the absence of the Secretary of the American Medical Association from his post on account of illness, my credentials did not arrive until so late last week that I was unable to present them, and do so now at the first opportunity.

I have the pleasure and the distinguished honor of bringing to the American Pharmaceutical Association, on its semi-centennial anniversary, a message of congratulation and fraternal good-will from the American Medical Association. As a Philadelphian, I note with pride that in this city, about fifty years ago, two national associations were brought forth devoted to healing the sick and reducing the aggregate amount of human suffering.

When we consider the advances that have been made during this period in the various departments of medical science—one of the most important of which your great Association ably represents—and when we contemplate the evidences of material and technical progress that surround us, not only in our laboratories but also in the hospitals and in general practice, we are convinced that modern medical science fully justifies itself and needs no apologist to defend it. Its good works form a monument visible to all. It therefore is passing strange that at the very time when the achievements of scientific medicine are so obvious that one would think that “a way-faring man though a fool need not err therein,” we see in some of our centres of culture, organizations springing up like mushrooms, that are based upon the negation of all that we hold to be most certainly true. We could look upon this new form of scientific agnosticism with amusement or simply academic interest, as a curious pathological phenomenon, were it not for one fact, and that is that the opinions of the people have an important influence upon sanitation and upon legislation for the public health. For instance, if the very existence of disease be denied, how can we carry out those measures for prevention, which experience and experiment have shown to be vitally essential? If there is no such thing as typhoid fever, at least outside the imagination of the patient, then the necessity of purifying our water supply will not be admitted. If there is no cholera, no yellow fever, no small-pox, except in the patient’s disordered mind, then we must abolish quarantine, disinfection and vaccination. But we need have no fear that these vagaries will be pushed to their logical conclusion. Sanitary science will not be turned back by such moonshine. As Lincoln said, “they can fool all of the people some of the time and some people all the time, but they can’t fool all the people all the time.” This curious phase of popular ignorance and credulity, so amazing in its presumption, is destined to be short lived, and the greater its pretensions the sooner will it pass into that obscurity which it is so eminently fitted to adorn. Modern medical science is securely founded upon the principles laid down by Leonardo da Vinci and by Francis Bacon; its basis is experiment and observation, its foundations are built upon fact and are sustained by sanity and common sense. As to those who are actively engaged in the new propaganda of anti-Christian nonsense, and find their pleasure and profit therein, we can apply to them the words of Mercutio, “He jests at scars who never felt a wound,” and the appropriate scripture, “Those who are whole need not a physician, but those who are sick.”

In conclusion, I would, if time permitted, express my appreciation of the valuable assistance which the delegates from this Association have rendered to the annual sessions of the Section on Therapeutics of the American Medical Association, and would express the hope that the practice will be continued in the interests of both medicine and pharmacy.

Dr. Woodbury’s remarks were applauded.

THE PRESIDENT: I am sure I voice the sentiment of those present in thanking Dr. Woodbury, and through him the American Medical Association for representation on this occasion.

The next order of business is the reports of committees.

Mr. Searby asked if he could make report now for the Committee on Time and Place of Next Meeting, to which the chair responded in the affirmative, when he read the following:

REPORT OF COMMITTEE ON TIME AND PLACE OF NEXT MEETING.

The Committee on Time and Place of Next Meeting respectfully report:

That invitations for 1903 have been received from South Bend, Ind., Niagara Falls, Mountain Lake Park Assn., Mackinac Island and Pipestone City, Minn.

Your Committee, after a careful canvass of all the conditions, unanimously recommend that the Association meet next year at Mackinac Island, and that the time be the 2nd Monday in August.

That we also have from the Mayor, Commercial Club and druggists of Kansas City, an invitation to meet at Kansas City in 1904, which invitation we recommend the Association to refer to the Council, that it may be brought before the Association next year.

Your Committee also recommend that a vote of thanks be tendered to all the parties who have extended to us invitations, and that they be informed that the same have received careful consideration.

Respectfully submitted,

W. M. SEARBY,
EMIL L. BOERNER,
E. L. PATCH,
GEORGE F. PAYNE.

THE PRESIDENT: The report of the Committee on Time and Place of Next Meeting is before you, gentlemen. What will you do with it?

MR. HOPP: I move that the report of the Committee be accepted, and that the recommendation to meet at Mackinac Island in the year 1903 be adopted. I had the pleasure of meeting with the Ohio State Pharmaceutical Association at Mackinac last July—in fact, was secretary. We had a delightful trip up to Mackinac and return, and a most delightful time at the hotel. To me it is a charming place. The hotel is large and spacious, and the rooms are elegant. The table, when we were there, was everything one could wish for. The service was excellent, and we had all the meeting-rooms we could ask for, without extra charge. They have a dance hall, committee-rooms, and in fact everything that you would want was given us without any charge whatsoever. I hope the members will seriously consider Mackinac as our next place of meeting.

MR. LOWE: What rates does the hotel offer?

MR. HOPP: I believe Mr. Whelpley has that matter in hand. We paid \$6 for two days.

MR. SEARBY: The proprietor, in a letter to Mr. Whelpley, makes a rate of \$3 per day on the American plan, with the use of the assembly room free of charge.

The chair called for action on the motion of Mr. Hopp, which was seconded by Mr. Eberle and carried, the chair declaring the vote to be unanimous.

The chair inquired what day of the month the second Monday in August of next year would fall upon, and Mr. Searby thought the 12th, but Mr. Good stated it would be the 10th.

MR. HOPP: Mr. President, I move that Mr. Whelpley be made a member of the Committee on Arrangements at Mackinac next year, on account of the hotel being owned by the proprietors of the Planters' House, at St. Louis, and Mr. Whelpley will be in a better position to make arrangements than any other member of the committee.

Mr. Searby seconded the motion and it carried.

The Secretary said that the next report in order was that from the Committee on Exhibition, which was very brief, but very important. He read it as follows:

REPORT OF THE COMMITTEE ON EXHIBITION.

To the Officers and Members of the American Pharmaceutical Association, Philadelphia, Pa.

Esteemed Friends: Your Exhibition Committee would respectfully report that during the year past they have conducted correspondence with nearly all the manufacturing concerns contributing in a legitimate way to the profession, and as a result have had placed in position an exhibition of crude and manufactured substances that we trust has been of some interest to our members.

We submit herewith a statement of our receipts and expenditures, together with a check for what remains over and above the items charged.

STATEMENT OF RECEIPTS AND EXPENDITURES.

Receipts from rent of space	\$1407.00
Expenditures as per vouchers:	
For rent of Horticultural Hall	\$375.00
For printing and stationery	36.25
For postage and telegrams	20.59
For railroad fare and hotel expenses.....	25.00
	<hr/>
	456.84
Balance on hand	\$950.16

Trusting that our work may meet with your approval, we remain,

Sincerely yours,

THOS. P. COOK,
Chairman Exhibition Committee.

The report of the Committee was applauded.

THE PRESIDENT: You have listened to the report of your Committee on Exhibition. What will you do with it?

MR. LOWE: I move that the report be accepted and entered on the minutes, and that a most hearty vote of thanks be extended the Committee on Exhibition for this magnificent show they have given us of pharmaceutical products and everything pertaining to pharmacy. The only regret I have is, that through some misunderstanding the exhibition was not continued until our final adjournment. A great many who wished to study the exhibit Saturday and to-day were disappointed. The Committee has done a splendid work.

The motion was seconded by Mr. Anderson and carried unanimously.

The Secretary called up the report of the Special Committee on Weights and Measures, Mr. F. G. Ryan, Chairman.

MR. RYAN: The Committee has made very satisfactory progress in the effort we are making to have the bill now before Congress adopted, and there is every probability of its coming up in the early part of the next session—that is the substance of the report.

The full text of the report was as follows:

REPORT OF THE SPECIAL COMMITTEE ON WEIGHTS AND MEASURES.

To the President and Members of the American Pharmaceutical Association,

Gentlemen: Your Committee on Weights and Measures desires to submit the following report. Since our last meeting, held in St. Louis, Mo., much activity has been shown by the various organizations interested in the introduction of the Metric System of Weights and Measures in the United States.

The Committee on Coinage, Weights and Measures of the House of Representatives has held numerous hearings at which many interested persons have appeared and urged definite action on the adoption of the bill now before Congress. Electrical and mechanical engineers, manufacturers of cotton and woolen goods and many others engaged in commercial and scientific pursuits have appeared before the Committee. The only opposition of importance to the adoption of the Metric System comes from machine and tool manufacturers, who claim they would be compelled to suffer great loss in changing their working tools from one system of standards to another. On the other hand, not a few in the same occupation state no great inconvenience would be experienced. A quotation from a statement made by Mr. Godfrey L. Cabot, of Boston, at the hearing of the Committee, will express the opinion of those who have given much thought to the subject.

"It is the common consensus of intelligent opinion in this country, both in and out of Congress, that we shall certainly adopt the Metric System. It is as inevitable as the extension of railways, telegraph lines and other modern facilities. The only practical question for you, gentlemen, is 'When and How?' We are brought face to face with this by the acquisition of insular dependencies, in which the Metric System is already in use. It would be pitiful for this progressive nation to impose on the colonies of Spain and Denmark a retrograde system of weights and measures less convenient and desirable than those they have enjoyed under their former owners."

Your Committee during the past year have sent to each member of the Association a copy of the bill now before Congress, and a form of petition to be addressed to Representatives in Congress, urging them to favor the adoption of the Metric System when the bill is presented for action. The Chairman desires to return his thanks for the many favorable replies received, stating that the request of the Committee had been complied with.

It was not possible to secure definite action by Congress at its last session. We are informed that the bill will be presented to Congress at the first favorable opportunity.

In closing this report we would urge the members of the Association to take an active interest in this subject, and by suggestion, in local organizations and with the daily and commercial press, endeavor to hasten the adoption of the Metric System in the United States.

Respectfully submitted,

F. G. RYAN.

Mr. Searby moved to accept the report and continue the committee, which motion was seconded by Mr. Good and carried.

MR. KLINE: Mr. President, I want to state what I understand the action of this organization so far on the alcohol question is, and then make a motion. My understanding is, that the President in his address recommended the endorsement of the Joy Bill, proposing to reduce the tax on spirits from \$1.10, the present rate, to 70 cents. That was referred to the Commercial Section, I believe. When it reached there the action of that body, after considering the question for some time, was against the adoption of the President's recommendation in that regard. Now I assume that that action was due to several causes, one of which seemed to be that the druggists present could not see that the proposed reduction of the tax on alcohol would be of any particular benefit to them. The reduction is very radical, and I suppose that had something to do with the vote, which was rather close—31 to 39, if I remember. Now, I can hardly believe that this organization intends to put itself on record as opposed to *any* reduction on alcohol, though it may not care to recommend so radical a reduction as from \$1.10 to 70 cents. My object in rising is to make a motion that this Association favor a reduction on alcohol.

MR. ENGLAND: I second the motion.

MR. KLINE (continuing): I want to remind the gentlemen that when this rate of \$1.10 on alcohol was adopted it was part of the Wilson Bill, and another portion of this bill provided for free alcohol for use in medicines and the arts; so the people who were interested from our standpoint accepted without protest the proposed advance, because they were amply protected, as they thought, in the guaranty of free alcohol for use in medicines and the arts. But the regulations prescribed never could be put in effect, so the Secretary said, and consequently this provision of the bill never went into effect; but this one now under consideration did, and has been in effect ever since, and we all buy or sell or take alcohol at the tax-rate of \$1.10 on the spirits. It was said the other day in the discussion that a majority of the members of this organization should not participate in bringing about the reduction in tax proposed in the Joy Bill, because it would have the effect to reduce the price of alcoholic preparations, and the druggist would be the loser. I do not believe that this would be the case. But whether so or not, is it not fair for us to request *some* reduction—if we cannot endorse the Joy Bill, let us ask for some reduction that will bring it down to some extent. It seems to me eminently proper that we should take action to that extent, at least; and I trust that my motion that we place ourselves on record as favoring a reduction, without saying how much, will be adopted.

MR. RYAN: I simply want to say that, when this subject comes to be voted on, I hope the gentleman will not be taken too literally. That is on the crude spirits, which is 50 per cent. alcohol.

MR. KLINE: I stand corrected on that.

MR. BORING: Referring to the vote on this question, upon further inquiry I see the thing differently, and I am glad of this opportunity to reverse my vote. I was under a misapprehension about this matter, and since I have learned that this proposed reduction is only 70 cents a gallon, which is less than 10 cents a pint, I cannot see where the disturbance to prices would come in, because the amount would be almost inappreciable, in the quantities in which the retail druggist dispenses his tinctures and extracts. Furthermore, it will be a reduction or saving of about \$20 a year to each druggist on his alcohol, and I consider it of sufficient moment to reverse my opinion and vote at this session for a reduction of the tax.

MR. ANDERSON: I understood the Commercial Section in taking action on this matter to make some recommendation to the general session.

THE SECRETARY: It has never come to the general session.

MR. MEISSNER: The Commercial Section did not make any recommendation to the general session. It simply refused to endorse the Joy Bill reducing the tax on alcohol 70 cents.

MR. EPSTEIN: The chairman of the Commercial Section must have misunderstood. The secretary, if I am correct, was instructed to make this recommendation to the general session. I believe the chairman is mistaken.

MR. MEISSNER: The chairman has no recollection of putting such a question.

MR. RYAN: While I am not a retail druggist, and will participate in the benefits that will come from this reduction of the tax on alcohol, I must confess I do not understand the retail druggist who wants it.

Mr. Kline's motion to favor some reduction in the tax on alcohol was then put to a vote and carried,

MR. SEARBY: I desire to bring before the Association another question of revenue tax—this time, however, not a question of excise tax, but of custom dues. I will read the resolution I have prepared, and then explain it.

WHEREAS, Recent treasury decisions of the Custom Department of the United States have arbitrarily thrown crude imported drugs, such as herbs, roots and barks preserved by alcohol sufficient to prevent fermentation, into the class of "*Alcoholic Compounds*," thus subjecting such crude drugs to a duty of 60 cents per pound and 45 per cent. *ad valorem*; such crude drugs are not alcoholic compounds, but are medicinal articles enhanced in value according to clause 20 Schedule A of "An Act to provide revenue for the government and to encourage the industries of the United States; they are properly therefore subject to a duty of $\frac{1}{4}$ cent. per pound and 10 per cent. *ad valorem*; therefore, be it

Resolved, That, inasmuch as the present classification is unjust and prohibitive, and bears enormously on American apothecaries and manufacturers of medicinal preparations to the benefit of foreign manufacturers, the American Pharmaceutical Association respectfully petitions the Treasury Department to reconsider the present ruling and place such crude drugs in class 20. Be it further

Resolved, That copies of these resolutions be forwarded by our Secretary to the Treasury Department, and to those officials of the government whose duty it is to consider such problems of concern to American interests, with a request that the ruling be reconsidered in accord with the foregoing.

MR. SEARBY (continuing): Now, you are aware that crude drugs are admitted duty free, but drugs enhanced in value are subjected to a tax of ten per cent. *ad valorem*, as already mentioned, and one-fourth of a cent per pound. That is a charge which can be tolerated. There are some drugs found in Germany, Great Britain and elsewhere which it is desirable to import into this country in a fresh condition, but they cannot be imported in that condition without some preparation—grinding, crushing or bruising, or in some way treated, and a small amount of alcohol added to them. They are not, however, after that process, to be considered as "alcoholic compounds," because the alcohol is subsequently removed, in order that the drugs may be ground. But the ruling of the Treasury Department so treats them, and subjects them to a duty of 60 cents a pound and 45 per cent. *ad valorem*, which is a prohibitive duty. The consequence is, preparations made from these fresh drugs must be made in Germany, or somewhere where the whole process may be completed. Now if these drugs were classified as medicinal articles enhanced in value, under clause 20, schedule A of the act to raise revenue and encourage industries, then they would be admitted by paying the duty of a quarter of a cent on the pound only, and 10 per cent. *ad valorem*, which would be proper and endurable. We want to reverse the ruling of the Treasury Department, and the resolution is aimed at that. It is true we might, after years of litigation, be able to set aside the ruling in the courts, but it is easier and better for all of us that the Treasury Department should modify its ruling. The law itself is all right enough; the trouble is, that a ruling has been made in the Department which makes it exceedingly onerous on the importers of such goods, and practically makes the tax prohibitive. I, therefore, move the adoption of the resolution I have just read.

Mr. Payne had been called to the chair pending this matter.

Mr. Lloyd seconded the motion to adopt the resolutions offered by Mr. Searby, and the motion was put and carried.

MR. SEARBY: Now I want to move the adoption of another resolution in connection with that matter:

Resolved, That copies of the foregoing resolution be forwarded to the National Wholesale Druggists' Convention, with a request that at their coming meeting they too, by resolution, protest against the present ruling of the Treasury Department and join in this petition.

Mr. Lloyd also seconded this resolution, and it was adopted.

Mr. Mayo presented the following resolutions adopted by the Section

on Education and Legislation at its second session this morning, and asked that they be also adopted by the Association at large :

WHEREAS, Pharmacy in its higher branches is confronted with many grave problems which can only be solved by original research conducted along broad lines, and involving labors so great as to be wholly outside the possibility of individual performance under ordinary conditions; and,

Whereas, The solution of these scientific problems is fraught with immense possibilities of good to the human race in the discovery of new drugs, and the simplification of our materia medica and its more complete comprehension; and,

Whereas, According to the articles of incorporation, the objects of the Carnegie Institution are :

“(a) To conduct, endow, and assist investigation in any department of science, literature, or art, and to this end to co-operate with governments, universities, colleges, technical schools, learned societies, and individuals :

“(b) To appoint committees of experts to direct special lines of research;

“(c) To publish and distribute documents;” therefore, be it

Resolved, That the American Pharmaceutical Association hereby petitions the Board of Trustees of the Carnegie Institution to establish an Advisory Committee on Pharmaceutical Research, with a view to promoting original research in pharmaceutical science, etc , etc., and be it

Resolved, That the President of the American Pharmaceutical Association be instructed to appoint a committee of twenty-five members, which committee shall be charged with the duty of laying the above resolutions before the Carnegie Institution, together with suggestions as to how the work of this Advisory Committee be conducted and made most effective.

MR. MAYO (continuing) : What we want to do is to impress the institution with the fact that pharmacists and pharmaceutical educators generally are greatly interested in this proposition—not only the individual members of the Association, but the institutions all over the country. I, therefore, move the adoption of these resolutions.

Mr. Beringer seconded the motion.

THE CHAIR: You have heard the motion of Mr. Mayo to appoint this large and representative committee.

THE SECRETARY: I would like to ask what relation this proposed research committee in the Carnegie Institute will bear to the proposed drug laboratory in the Department of Agriculture.

MR. MAYO: There is not necessarily any relation. It occurred to the committee that the researches of the Carnegie Institute would approximate those in pure science. The line of work to be undertaken by the Department of Agriculture, as outlined by Dr. Wiley, would seem rather in the line of applied science; and it was hoped by the committee that the President would appoint Dr. Wiley as a member of the committee, to insure complete comprehension of the fact that there was no conflict between them. They have a department of chemistry in the Department of Agriculture, and in the Carnegie Institute there is a committee on chemistry, and there is no conflict between the two.

Mr. Mayo's resolutions were then put to a vote and adopted.

President Whelpley resumed the chair.

THE SECRETARY: I had intended to present the report of the Committee on Procter Memorial at this time, but the chairman of the committee is out of the room, and a number of our veteran members are out, personal friends of Mr. Procter; so I think we had better postpone that a little while and take up some communications that have been received within the last two or three days, and which could not be presented earlier.

The Secretary then read a congratulatory cablegram from the Deutscher Apotheker Verein, of Berlin, and telegrams of the same tenor from the Massachusetts Pharmaceutical Association through its secretary, Mr. Guerin, at Worcester, and Mr. Leo Eliel, of South Bend, Ind., an old and honored member of the Association, whose presence was missed at the meeting. These messages were received with applause.

BERLIN, *Sept. 10, 1902.*

AMERICAN PHARMACEUTICAL ASSOCIATION, PHILA., U. S. A.:

Hearty congratulations on the occasion of the jubilee meeting.

DEUTSCHER APOTHEKER VEREIN.

WORCESTER, MASS., *Sept. 10, 1902.*

CHAS. CASPARI, *Secretary, American Pharmaceutical Association:*

The Massachusetts Pharmaceutical Association sends congratulations on occasion of fiftieth annual meeting, regret inability of officers to be present.

J. F. GUERIN, *Secretary.*

SOUTH BEND, IND., *Sept. 9, 1902.*

H. M. WHELPLEY, *President, American Pharmaceutical Association, Hotel Walton, Philada.:*

Success to Golden Jubilee; wish profitable and enjoyable meeting; regards to all; regret inability to attend; again urge and invite meeting to South Bend next year.

LEO ELIEL.

The Secretary also read a telegram from Surgeon-General Wyman, of the Public Health and Marine Hospital Service, thanking the Association for its telegraphic invitation to be present, and its words of appreciation of the appointment of delegates from this service, and extending congratulations and good wishes for the future. Also letters of a congratulatory character from the Surgeon-General of the Army, Dr. R. W. O'Reilly, and the Surgeon-General of the Navy, Dr. P. M. Rixey, expressing their regret at their inability to attend the meeting, as well as the impossibility of sending delegates on the short notice given to represent their Departments.

WASHINGTON, D. C., *Sept. 9, 1902.*

HON. H. M. WHELPLEY, *President American Pharmaceutical Association, Philadelphia, Pa.,*

Dear Sir: Allow me to thank you for your kind telegram of to-day, extending an invitation to attend the meeting of your Association, and also for your words of appreciation of the appointment of delegates from this service. Pressing public duties prevent my absence from Washington at this time, but I wish to congratulate you and the Association on this, your fiftieth anniversary, and am pleased that so cordial a feeling exists between the American Pharmaceutical Association and the public health and marine

hospital service, and trust that hereafter this feeling will be still further strengthened by the annual representation in your body of our pharmacists.

WALTER WYMAN, *Surgeon General.*

WAR DEPARTMENT,
SURGEON GENERAL'S OFFICE, }
WASHINGTON, Sept. 9, 1902.

MR. H. M. WHELPLEY, *President American Pharmaceutical Association, Philadelphia, Pennsylvania.*

My Dear Sir: Your very kind telegram asking me to attend the meeting of the American Pharmaceutical Association is just received. While thanking you for such a cordial invitation, I regret that it will not be possible for me to be present, as just now my time is wholly employed by official business.

Furthermore, I am sorry that, owing to the short notice, it would not be practicable to assemble five Hospital Stewards and get them to Philadelphia before your adjournment.

Believe me, sincerely yours.

R. W. O'REILLY, *Surgeon General, U. S. Army.*

WASHINGTON, D. C., September 9, 1902.

Dear Sir: I beg to acknowledge your telegram of this date, extending me an invitation to be present at the meeting of the American Pharmaceutical Association in Philadelphia during this week. I regret that, owing to the pressure of duties, I shall be unable to take advantage of your kind invitation.

The limited number of pharmacists and the demands made upon them by the service, render it impossible to detail any of that grade for duty as delegates to the meeting of your Association. Surgeon Clement Biddle, U. S. N., has received orders to represent the Medical Department of the Navy at this gathering of the Association of which you are the President.

Trusting that the meeting will be highly successful, and thanking you for your kind invitation, I am,

Very truly yours,

P. M. RIXEY, *Surgeon General, U. S. Navy.*

H. M. WHELPLEY, *President American Pharmaceutical Association, Philadelphia, Pa.*

The Secretary stated that there had come to his hands a large number of letters from Europe and elsewhere, from individuals and institutions, sending greetings and congratulations upon the attainment by the Association of its fiftieth anniversary. The Council had directed that the Committee on Publication make such use of these communications for publication in the Proceedings, he said, as they may see fit. Mr. Lowe asked if these letters would be acknowledged, and the Secretary replied that they were chiefly in answer to invitations sent to the various institutions in question.

The Secretary then read the following communications from the Pharmaceutical Society of Great Britain and its Northern Branch in Scotland:

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, }
17 BLOOMSBURY SQUARE, LONDON, W. C. }
August 6th, 1902.

The President, American Pharmaceutical Association.

Dear Sir: At a meeting of the Council of this Society held here to-day, a resolution was unanimously passed requesting me on behalf of the Society to send you a letter of

congratulation on the occasion of the fiftieth anniversary of the American Pharmaceutical Association.

British pharmacists follow with very great interest the evolution of Pharmacy in the United States, and we rejoice to know that you have been able to wield a remarkable beneficial influence in consolidating and organizing those who practice the pharmaceutical calling in America.

The best wishes of our members go out to their transatlantic brethren, and we hope that the Jubilee Session to be held on September 8th will meet with a success commensurate of the occasion.

I have to express on behalf of my Council deep regret that neither I nor any of my colleagues are able to arrange to be present to meet some of the representatives of American Pharmacy whom we have so long known and esteemed.

I am, dear sir, yours faithfully,

[SEAL.]

G. T. W. NEWSHOLME, *President.*

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, }
NORTH BRITISH BRANCH, }
36 YORK PLACE, EDINBURGH, *July 21, 1902.*

CHARLES CASPARI, JUNR., ESQ., *General Secretary, American Pharmaceutical Association, 109 Aisquith Street, Baltimore, U. S. A.*

GOLDEN ANNIVERSARY.

Dear Sir: Your courteous invitation to members of the Pharmaceutical Society in Scotland to be represented by delegates at the Fiftieth Annual Meeting of your Association in Philadelphia on September 8, 1902, has been laid before the Executive of the North British Branch.

We regret that it will not be possible for any of our members to have the honour and pleasure of being present with you on so important an occasion.

I am desired, however, to thank your Association for their courtesy and to assure you of the lively interest with which we follow all your proceedings, of our hearty congratulations on the long and honourable career which has now reached its Golden Anniversary, and of our cordial desire that you may long continue to occupy the high place you now possess among the pharmaceutical associations of the world.

I am yours faithfully,

PETER BOA,

Chairman of the Executive of the North British Branch.

These kindly words of congratulation and friendly interest from sister societies across the seas were received with every evidence of sincere appreciation by the Association; and the Secretary said that he might add that of the large number of letters he had previously referred to as having been received, many were fully as cordial in their expressions and as appreciative as those just read.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, }
17, BLOOMSBURY SQUARE, LONDON, W. C., }
August 21, 1902.

MUSEUM DEPARTMENT.

THE PRESIDENT, THE AMERICAN PHARMACEUTICAL ASSOCIATION,

Dear Sir: Your kind invitation to attend the Jubilee Celebration of the Association is to hand this morning. I had been looking forward with most pleasant anticipations to the possibility of being present and of meeting once again several of your leading Professors, as well as members of well-known pharmaceutical firms, of whose genial

manners and delightful conversational powers I retain the most happy recollections. But on offering to go as a delegate from this Society, the Museum Committee were, I was informed, unwilling to spare me from my duties here, which as in most museums are often heavier during the recess than at ordinary times, since collections have then to be overhauled, a work which cannot be done so well when the museum is in constant use by students.

But I am sure you will permit me, none the less, to do what I should have done had I been able to be present, viz., to offer *my heartiest congratulations* to the President and members of the American Pharmaceutical Association on the celebration of its Jubilee and on the excellent work that it has done during the last fifty years. In this country the leading pharmacists look upon the "Proceedings of the American Pharmaceutical Association" as a model of what such a publication should be. May I add that I hope the Association will continue to prosper and to hold its position as, I believe, the largest and most successful association of its kind in the world. I am proud of the privilege of being an honorary member of it. I remain, Dear Sir,

Yours faithfully,

E. M. HOLMES.

"ASHLANDS," WATFORD, HERTS, ENGLAND, }
27th August, 1902.

TO DR. HENRY M. WHELPLEY, *President of the American Pharmaceutical Association* :

My Dear President : I thank you for the invitation to be present at the Jubilee Semi-Centennial Meeting of the American Pharmaceutical Association. My sympathy with the objects of the Association; the usefulness to me of that grand work of reference, the 49 volumes of its Proceedings, presented to me by the Association; my highly prized honorary membership of the Association for now more than thirty years; my personal acquaintance with many of its members who have visited England, and the high esteem in which I hold these and others with whom I have corresponded; my admiration of the manner in which the Association has fostered the scientific and social position of its members, and has ever striven to maintain the honor and dignity of pharmacy : all these considerations, I say, have made me look forward for some years to the personal joy of communion with my colleagues at this meeting, and to the opportunity of showing how highly an Englishman, who is familiar both with the broad aims and the detailed labors of such an organization, can appreciate the important position which the Association fills not only in the brotherhood of science and trade with which it is more immediately conjoined, but in the general welfare of the great community of the United States. On the other hand, alas ! for some years have also come to me infirmities which, accumulating, now forbid indulgence in the delights of travel or of the excitement, strain, and prolonged festivities incident to great gatherings of friends. For these reasons, and these only, I must, with the utmost regret and disappointment, forego the pleasure of accepting your invitation.

I congratulate the American Pharmaceutical Association on reaching its jubilee. I trust that the next fifty years of its work will be even more brilliant than the work of the fifty now ending, and I pray that from century to century it will satisfactorily progress in influence and usefulness. I am, my dear President,

Yours faithfully,

JOHN ATTFIELD.

(Translation.)

ST. PETERSBURG, July 4/17, 1902.

To the American Pharmaceutical Association, Philadelphia :

I beg to send a cordial greeting and hearty congratulations on the occasion of the festive day which closes the first half-century of your glorious Association's life, and regret deeply that I can not personally bring you my good wishes and participate in your festivities.

Fifty years of uninterrupted activity can not fail to leave permanent impressions, and all who have aided in the furtherance of professional welfare are ready to admire and appreciate the work of others. For years I have felt a keen interest in the lives and labors of my American confreres and have looked forward with much pleasure to the annual receipt of your most excellent Proceedings, which have brought full accounts of your researches and discoveries in the field of Pharmacy. I have taken pains to acquaint my professional brethren here with your doings, and beg to assure you that we all feel united by bonds of warm sympathy to our American colleagues. We honor the names of the noble men of your country who have freely and disinterestedly placed the results of their labors at the disposal of all. Among these names are many of which American Pharmacy may justly feel very proud.

Your Association has achieved much during the past fifty years, but the future will make still greater demands, and therefore your motto should always be: Upward and Onward.

I value highly the distinction of honorary membership in the American Pharmaceutical Association, and trust that your good work will continue to redound to the benefit of Pharmacy throughout your great country.

MAGISTER JOHANNES VON MARTENSON.

FINHAUT, CANTON OF VALAIS, SWITZERLAND, }
August 27, 1902. }

To the President of the American Pharmaceutical Association, Philadelphia, U. S. A.

Most Honored Sir: Thanking the committee of the Association very sincerely for the kind invitation to the annual and jubilee meeting, I am very sorry not to be able to participate in the meeting otherwise than by means of a scientific paper, which, some weeks ago, was forwarded to the Chairman of the Committee on Scientific Papers, Mr. Kebler. Besides the great distance from Strassburg to Philadelphia, I am kept here by the annual meeting of the Society of Swiss Naturalists to be held at Geneva in the very same week (Sept. 7 to 12) as your meeting of the A. Ph. Association. Being an old member of said Society, founded at Geneva, I shall have to read several scientific papers in the chemical and pharmaceutical sections of the conference.

But I desire very sincerely to present to the American Association, through your kind agency, my very best wishes and congratulations on the occasion of the jubilee meeting, which shall be a day of honor to the Association, to be an honorary member of which for many years I have always felt proud. I hope that the meeting will pass off to the satisfaction of all the members, and that the transactions and discussions will prove of real profit to the aims of the Association.

In this sense I remain, dear sir, with my respectful regards,

Very truly yours,

PROF. EDWD. SCHAEER, M. D.

[Translation.]

MARBURG, August 23, 1902.

To the President of the American Pharmaceutical Association, Philadelphia.

Dear Mr. President: Please accept my sincere thanks for your kind invitation to be present on the occasion of the semi-centennial jubilee festival of the American Pharmaceutical Association. I regret very much that it will be impossible for me to undertake the journey, and I beg that you will convey to the Association my hearty congratulations and cordial greetings.

Very respectfully,

ERNST SCHMIDT.

MONTREAL, September 3, 1902.

HENRY M. WHELPLEY, ESQ., *President American Pharmaceutical Association.*

Dear Sir: I am requested by the Council of the Pharmaceutical Association of the

Province of Quebec, Canada, to accept, on behalf of our Association, your very kind invitation to attend the Jubilee Semi-Centennial Meeting of the American Pharmaceutical Association, to be held in the city of Philadelphia, and that our Association will be represented at that meeting by our President, Mr. Seraphin Lachance, of Montreal, and Mr. Henry Willis, of Quebec.

Yours sincerely,

G. MUIR, *Secretary-Registrar.*

[*Translation.*]

ST. PETERSBURG, August 24, (*September 6,*) 1902.

To the American Pharmaceutical Association at Philadelphia :

On behalf of the Curators of the St. Petersburg Pharmaceutical Society, I beg to convey the Society's hearty congratulations on the occasion of your Semi-Centennial Jubilee meeting, coupled with the wish that the American Pharmaceutical Association may long continue in its successful career.

A. KLINGE, *Secretary.*

[*Translation.*]

VIENNA, *September 1, 1902.*

To the American Pharmaceutical Association assembled at Philadelphia :

On the occasion of its Semi-Centennial Jubilee we are sending our cordial greetings and congratulations to our honored sister society in the far West. May the Association continue to develop and prosper during the coming fifty years as it has done in the past, so that on the occasion of its centennial jubilee it may enjoy the same esteem and appreciation which are now being extended by numerous communications from all parts of the world.

The Council of the Austrian Pharmaceutical Association,

DR. HANS HEGGER, *Secretary.*

MEDIA, PENNA., *Sept. 1, 1902.*

DR. HENRY M. WHELPLEY, *President of the American Pharmaceutical Association :*

I appreciate most gratefully the courteous invitation to attend the approaching Jubilee Semi-Centennial of the organization of the American Pharmaceutical Association. Most truly do I rejoice with its members, and sympathize with them heartily in the marvelous success of the Association. Yet I must respectfully decline the honor of attending the meeting, which I earnestly hope may prove to be *all* that its most ardent friends desire for it, and am truly its friend.

CATHARINE PROCTER,
(MRS. WM. PROCTER, JR.)

RAVENSWOOD, LOW FELL, GATESHEAD, }
August 30, 1902.

PROF. HENRY M. WHELPLEY, *President American Pharmaceutical Association, Phila.:*

My Dear Mr President : It is with profound regret that I write to tell you that it is impossible for me to attend our annual and semi-centennial meeting in Philadelphia. I have looked forward to doing so for at least two years, and I have delayed to write the final word in the vain hope that at the last minute I might find it possible to get away and come to you. Philadelphia is closely associated with my early days in pharmacy, from the fact that I was a pupil of the late Henry Deane, who was an honorary member of the College of Pharmacy of Philadelphia (of which he was very proud), and he had frequent correspondence with the many distinguished pharmacists who were prominent in establishing and carrying on the work of that College. In addition to that, I have on two occasions visited the city and can speak from a personal acquaintance of its ideal College of Pharmacy and of the enthusiasm and sincerity of the teachers connected with it. The last time I had the privilege of being the guest of my very dear friend and our Associa-

tion's staunch supporter, Prof. Remington, at his delightful home in Atlantic City. My first visit to America was eighteen years ago, and my second nine years, and I did so long to come again this year that I am sure you will understand my disappointment. Beside, in the hope that at the last moment I might come, the British Pharmaceutical Conference Executive appointed me one of their delegates, and I must ask you, Mr. President, to accept my apology for not being able to present my credentials in person, and of being able to assure you of the fraternal regard which English pharmacists entertain for their American confreres, and how highly they appreciate the scientific work of the American Pharmaceutical Association. Will you, dear Mr. Whelpley, convey this and as much as you deem prudent of this letter, to the members in session assembled. I had thoughts at one time of sending you a contribution upon the present condition and immediate prospect of pharmacy, but a contemplation of it has been too dispiriting for the attempt to be made. You know that I have always held that the pharmacist should be a scientific man, and that in the exercise of his calling he should in all truth and sincerity perform it in a professional spirit. So much, however, is day by day happening to cloud such an ideal, and to cause it to drift further and further from our grasp. The last and worst enemy of pharmacy in its time, in word, spirit and meaning, is the invasion of the capitalist (whether an individual or a company) who employs pharmacy merely as a dollar-accumulating craft, and purchases his science and the brains of the business in precisely the same way that he buys any other of the raw commodities he requires. It is taking the heart out of pharmacy proper and what will be the outcome it is difficult to see, although I still have faith in pharmacy for the pharmacist if the latter will be true to himself and strive with all his scientific might to disentangle himself from the grasp of the merely commercial element.

On both occasions that I visited America I spent a most delightful day with the late Dr. E. R. Squibb, and I shall miss him when I come again.

Last year at Glasgow and at Dublin it was delightful to see our friend Prof. A. B. Prescott; the only drawback was that we saw so little of him, but then, like many of you, when you come over to this side of the Atlantic, he wanted to do so much. I shall be physically on this side of the Atlantic while you are in session, doing my work as best I can; but a very big proportion of my thoughts will be with you, and I shall picture you delivering your address, the various sessions and animated discussions, the banquet, the special Golden Jubilee meeting, presided over by my friend Dr. Frederick Hoffmann, and to all of it I shall wish a hearty God-speed and the greatest good for our common heritage and mistress—pharmacy. It will be too long a list for me to mention all the names I should like to, but there is Prof. Remington, our Treasurer, Mr. Sheppard, my friend John Uri Lloyd and many others; will you offer them a hearty hand-shake for me and tell them I still hope the visit is only postponed to another year?

With kind regards, and wishing you a most successful meeting, I remain,

Yours sincerely,

N. H. MARTIN.

6 KING STREET, SNOW HILL,
LONDON, E. C., *August 25, 1902.* }

PROFESSOR HENRY M. WHELPLEY, *President of the American Pharmaceutical Association,*

Dear Professor: Please accept my hearty thanks for the kind invitation to be present at the jubilee semi-centennial meeting of the American Pharmaceutical Association, which convenes in Philadelphia on September 8.

I regret exceedingly that my distant residence renders it impossible for me to be with you, and to share the pleasure of meeting the many professional friends who will be assembled on that happy and memorable occasion. I am sure that the meeting will be a most successful and inspiring one, and trust that the influences which go forth at

this time may extend through another half century, carrying with them not only the impress of present achievements, but contributing in a large measure to the future prosperity and advancement of American pharmacy.

With sincere congratulations and cordial greetings, believe me to remain,

Faithfully yours,

FREDERICK B. POWER.

SNOW HILL BUILDINGS,
LONDON, E. C., *September 3, 1902.* }

Dear Professor Whelpley: I thank you for your kind invitation to the golden jubilee meeting of the American Pharmaceutical Association at Philadelphia, but I am exceedingly sorry that it is not possible for me to be present.

I offer you and all members my hearty greetings and good wishes for the continued prosperity of the Association.

Yours sincerely,

HENRY S. WELLCOME.

BALTIMORE, *September 12, 1902.*

PROFESSOR H. M. WHELPLEY, *President American Pharmaceutical Association,*

My Dear Doctor: I had been fully in hope of being with you, at least yesterday, on the day of the celebration of the Golden Jubilee of our Association. A slight relapse of an injury to a muscle, sustained some weeks ago in a mountain trip, has prevented me from going to Philadelphia. But I at least desire to send my most hearty congratulations to the Association and my personal greetings to my friends. May the Association prosper in the future, and may you all have a good time during this meeting.

Yours sincerely,

WM. SIMON.

Acknowledgments and congratulatory responses were also received by the President from

Prof. A. W. Gerrard, England.
Prof. D. Mendeleef, Russia.
Prof. M. Berthelot, France.
Prof. L. Planchon, France.
Prof. I. Guareschi, Italy.
Prof. R. Kobert, Germany.
Prof. H. Beckurts, Germany.
Prof. Schlagdenhauffen, France.
Prof. E. Fischer, Germany.
Prof. A. Ladenburg, Germany.
Prof. H. G. Greenish, England.
Prof. H. A. Allen, England.
Prof. A. Tschirch, Switzerland.
Prof. O. Wallach, Germany.
Prof. B. Tollens, Germany.
Prof. C. R. Tichborne, Ireland.
Prof. A. Hilger, Germany.
Prof. F. Ranwez, Belgium.
Prof. F. Seiler, Switzerland.
Prof. C. Liebermann, Germany.
Sir Wm. Thomson, England.
R. Bremridge, Esq., England.
S. R. Atkins, Esq., England.
Walter Hills, Esq., England.
A. T. Ferrall, Esq., Ireland.

H. A. D. Jowett, Esq., England.
F. B. Bengier, Esq., England.
Chas. Symes, Esq., England.
J. P. Catford, Esq., England.
R. C. Cowley, Esq., England.
B. H. Paul, Esq., England.
W. A. H. Naylor, Esq., England.
E. H. Farr, Esq., England.
F. A. Upsher Smith, Esq., England.
E. Saville Peck, Esq., England.
Alex. Bottle, Esq., England.
L. N. Atkinson, Esq., England.
Chas. Umney, Esq., England.
John Umney, Esq., England.
David Howard, Esq., England.
Wm. Warren, Esq., England.
F. Ransom, Esq., England.
J. O. Braithwaite, Esq., England.
J. C. Thresh, Esq., England.
Wm. Ransom, Esq., England.
H. W. Gadd, Esq., England.
W. R. Atkins, Esq., England.
D. Macalister, Esq., England.
Thos. Maben, Esq., Scotland.
D. B. Dott, Esq., Scotland.

J. C. McWalter, Esq., Ireland.
 J. C. C. Payne, Esq., Ireland.
 B. R. Clinton, Esq., Ireland.
 P. Kelly, Esq., Ireland.
 J. J. Bernard, Esq., Ireland.
 Dr. O. Hesse, Germany.
 Dr. Böttger, Germany.
 F. Kober, Esq., Germany.
 Dr. A. Schneider, Germany.
 Dr. E. Biltz, Germany.
 Dr. Salzmann, Germany.
 Dr. W. Ambrosius, Germany.
 A. Frickhinger, Esq., Germany.
 L. Zumbroich, Esq., Germany.
 J. Polak, Esq., Holland.
 Chas. Buchet, Esq., France.

C. G. Patrouillard, Esq., France.
 G. Bocquillon-Limousin, Esq., France.
 Ch. Tanret, Esq., France.
 C. Crinon, Esq., France.
 Dr. H. Heger, Austria.
 H. P. Madsen, Esq., Denmark.
 Dr. Schmid, Switzerland.
 Dr. E. Van Melckebeke, Holland.
 F. Delchevalerie, Esq., Belgium.
 M. Duyk, Esq., Belgium.
 A. Jonas, Esq., Belgium.
 Dr. A. Cattold, Italy.
 H. Shillinglaw, Esq., Victoria, Australia.
 A. Forster, Esq., New South Wales, Aus.
 Dr. Ed. Liceaga, Mexico.

The President now called for the report of the Delegates to the Section on Materia Medica, Pharmacy and Therapeutics of the American Medical Association, and Mr. C. S. N. Hallberg, Chairman, presented the following :

REPORT OF DELEGATION TO THE SECTION ON MATERIA MEDICA, PHARMACY AND THERAPEUTICS, A. M. A.

To the American Pharmaceutical Association :

Of the delegation appointed by the President the following members attended the 53d annual meeting of the American Medical Association, at Saratoga Springs, N. Y., June 10-13, 1902: Dr. Albert B. Lyons, Detroit, Mich.; Messrs. Thos. P. Cook, Smith E. Jelliffe, Caswell A. Mayo, Jokichi Takamine, N. Y., and the chairman of the delegation, the undersigned.

Mr. Mayo responded to the address of welcome of the Chairman of the Section, Geo. F. Butler, Ph. G., M. D., on behalf of the delegation.

An interesting program of some thirty papers maintained the interest in the Section for three days. It may be worthy of notice that no papers are permitted to be read in the absence of the author; that no paper will be received which has been previously published in whole or in part; and that after a paper has been read it becomes absolutely the property of the Association, and cannot be published until it has appeared in the Journal of the Association. No paper is admitted to the official program except from members, associate members or foreign members by invitation of the Section.

No paper is allowed to be read not on the official program, and no title is received after thirty days preceding the date of the meeting, when the program is published. An abstract of every paper is also required, but not invariably insisted on. The reading of a paper must not exceed twenty minutes.

Among the papers presented the following may be of especial interest to our Association :

"The Place and Importance in the College (Medical) Curriculum of Pharmacy," by Jacob Allen Patton, Chicago.

"The U. S. Pharmacopœia of 1900," by Jos. P. Remington, Philadelphia.

"The Tropeines," by Albert B. Lyons, Detroit, Mich. This paper was one of three, being a symposium on the Mydriatic Drugs.

"Some New Sugar Tests," by Albert B. Lyons.

"The External Preparations and their Therapy," and "Dosage of Liquid Medicines," by C. S. N. Hallberg.

"Prescription Repetition and its Dangers," by W. C. Alpers, New York, N. Y., by permission read by title.

"Nerve Nostrums and their Dangers," by Wm. P. Spratling, Sonyea, N. Y., of the State Epileptic Institution.

"Hypnotics, Analgesics and Resultant Drug Additions," by Smith Eli Jelliffe, New York, N. Y.

The last two papers were reported to a committee to report upon next year, consisting of Almerin W. Baer, Chicago, W. J. Robinson, New York, and H. R. Slack, Georgia; all of these were pharmaceutical graduates.

The paper "Dosage of Liquid Medicines" was also referred to a committee to report on next year, consisting of Drs. Woodbury, Wood, Jr., and Eshner, all of Philadelphia.

A resolution opposing the manufacture and sale of antitoxins and vaccine by municipalities or State Boards of Health was passed.

It was ordered that exhibitors limit the distribution of samples and literature of their articles on exhibition to persons wearing the official badges of the Association. The exhibit netted the Association about \$10,000.

The following officers were elected:

Chairman—Solomon Solis-Cohen, Philadelphia.

Secretary—C. S. N. Hallberg, Chicago.

The next meeting of the Association will be held at New Orleans in April, 1903.

Chicago, Sept. 1, 1902.

C. S. N. HALLBERG, *Chairman.*

THE PRESIDENT: Gentlemen, you have heard the report from your delegation to the Section on Materia Medica and Pharmacy of the American Medical Association. What action will you take on it?

Mr. Wilbert moved to receive and refer for publication, which motion was seconded and carried.

The report of the Committee on Status of Pharmacists in the Government Service was called for, and Mr. Payne, chairman, presented the report in abstract, the full text being as follows:

REPORT OF THE COMMITTEE ON THE STATUS OF PHARMACISTS IN THE ARMY, NAVY AND MARINE HOSPITAL SERVICE OF THE UNITED STATES.

The result of the work of your committee during the year just passed has been very encouraging. While we have not secured the advance we desire and to which we are fully entitled, we have received additional concessions for which we have been steadily working since the first appointment of our committee several years ago. We also feel much encouraged in regard to the future. Our steady and persistent work has won us continuous advancement. When we consider the tremendous size of our country and the many gentlemen in Congress and in the Departments to be shown and convinced of the injustice of the present status of our Government Pharmacists and its reflection upon the whole profession of pharmacy, we realize the vast character of the work of our committee, and we feel that the American Pharmaceutical Association has cause to congratulate itself upon the continued success of a movement in which nearly every member of the Association has most cordially co-operated, and has done valuable work, in which the other Associations of Pharmacists, and the individual pharmacists of the United States, have willingly and gladly aided.

In the army the hospital stewards are tied down even more severely by red tape than in either the Navy or the Marine Hospital Service. In the past we met with some encouragement from the former Surgeon-General in regard to increase of salary for the Army Hospital Stewards, and we have hoped to see this taken up by the Department itself, as this is the preferable and most pleasant manner in which to bring about such changes. The former Surgeon-General, Dr. Sternberg, has retired, and Dr. Wm. H. Forwood recently became Surgeon-General of the United States Army. The following letter written to him by our committee during last July explains itself:

ATLANTA, GA., July 2, 1902.

SURGEON-GENERAL WM. H. FORWOOD, M. D., *Washington, D. C.*

Dear Sir: As you are doubtless aware, the pharmacists of the United States are deeply interested in the proper recognition of pharmacists in our public service. Pharmacy has been steadily advancing in its scientific attainments, and in its position with the public. Time was, when the pharmacist was considered the doctor's cook, and the surgeon was the barber, whose bloody rag wrapped around a post is said to be the origin of the present barber's pole. The splendid attainments of surgery and medicine have secured better and better recognition, as they so richly deserve, but the recognition of pharmacy hangs halting in the background, while veterinary practice and dentistry are recognized; and even the mail-carriers receive \$1,200 a year. Pharmacists and pharmaceutical chemists have done and are doing much for the advance of medicine—so much so that some surgeons claim that the ready-made pharmaceutical preparations, tablets, etc., which are now used in the medical service, render the services of a skilled pharmacist almost unnecessary in the army. This is a serious slur upon the medical officers of the army, which I do not feel to be true. It is a fact that the ready-made formulæ and combinations of the manufacturing pharmacists are wonderfully convenient and portable, but ready-made prescriptions do not meet all the requirements of the medical officer, and the better his capacity the more capable is the pharmacist required to be to carry out his ideas.

In the examination of water and food supplies the pharmacist should be the valued chemist of the medical officer. For far more men die of sickness and disease, even during actual warfare, than from missiles of the enemy. Prompt judgment upon food and water supplies and daily knowledge of their true character will enable the medical service to save our government enormous sums of money every year, which are now expended upon our sick soldiers, who have been made ill by impure water and by contaminated and adulterated food.

The pharmacists of the United States earnestly desire better pay for the hospital stewards of the United States Army, and the title of pharmacist—this title is now accorded to both the Navy and Marine Hospital Service. If the increased pay is not commensurate with your views of public policy, on account of the expense involved, we would like to see at least a limited number of pharmacists appointed, with good rank and salary, just below the assistant surgeon. The stigma of a pharmacist being called a "hospital steward," would be removed and a better service secured. We have been led to believe that you are in touch with better recognition for pharmacists, as are many of our other prominent leading medical men. The pharmacists of every other civilized country in the world, with but one exception, hold commissions. Even in half civilized Japan they rank as second lieutenants: in France they rank as high as General of Brigade; in Germany they rank from second lieutenant to Colonel. The United States has recently advanced her pharmacists in the Navy, as has England. Many of our prominent public men have assisted us in the recognition we have secured in the Navy. President Roosevelt, when Assistant Secretary of the Navy, aided us materially, as he did also in the National Guard of New York, when he was Governor of that State.

As Chairman of the Special Committee of the American Pharmaceutical Association for proper recognition of pharmacists in the service of our Government, I beg you to take some action in this matter. If an adequate number of pharmacists are appointed with proper salaries, it will be deeply appreciated by the pharmacists of the United States.

We have been treated with considerable more consideration in the Navy than in the Army, and we trust that you will see your way clear to carry out our wishes in this branch of the service under your control.

With our present Army Hospital Stewards, the spirit of the pharmacy laws in many of our States is being violated.

If you will request the desired legislation, or intimate how far you can approve our wishes, the pharmacists of the United States, who are better organized than ever before, will most heartily urge the passage of such legislation through their representatives in Congress. The pharmacists are leading men in every city, town and hamlet in the United States, and are deeply interested in this desired recognition.

Very respectfully,

GEORGE F. PAYNE.

Chairman Special Committee American Pharmaceutical Association, and Vice-President A. Ph. A.

Dr. Forwood's reply was as follows:

DR. GEORGE F. PAYNE, *Vice-Pres. American Pharmaceutical Association, etc., Atlanta, Ga.,*

Dear Doctor: I am in receipt of your communication of the 2nd inst., which I have read with a great deal of interest. The subject therein alluded to is by no means new, and, from the records of this office, must have received considerable attention at the hands of my predecessor, with whose views I am in accord. As you doubtless know, the Medical Department—identical with other departments—is made up of officers and enlisted men, the latter non-commissioned officers and privates, the non-commissioned officers being hospital stewards and acting hospital stewards, to whom doubtless your letter particularly refers. The regulation outlining the duties of these non-commissioned officers is as follows:

"34. The duties of hospital stewards and acting hospital stewards, are to nurse or supervise the nursing of the sick, to compound and administer medicines, to look after and distribute hospital stores and supplies, to supervise the preparation and serving of food, to care for hospital property, to maintain discipline in hospitals and watch over their general police; to prepare reports and returns; to supervise the duties and assist in the instruction of members of the hospital corps in hospital and field; and to perform such other duties as may be, by proper authority, required of them."

From the foregoing outline it will be observed that their duty as compounders of drugs is but a small part of the work that they are required to do, and as General Sternberg remarked in a former communication, should pharmacists be given commissioned rank, we yet should be obliged to have hospital stewards.

The pay of the hospital steward in the United States Army is equivalent to about \$100.00 monthly, when all perquisites are considered. As he has practically a life position with a retiring pension of three-fourths of his pay after thirty years service, it is believed that his present position, in pay and permanency, is far better than that of the average graduates of a school of pharmacy, and that there is no present reason why his stipend should be increased.

As to the title of pharmacist, it must be evident to you from the statement of duties of this office that such title would be inappropriate. You refer to pharmacists in other armies. Such a corps undoubtedly does exist in some of them, but they occupy in no sense the position held by the non-commissioned officers in the United States Army. For the most part they are equivalent to our medical supply officers, or rather to what were known in our army during the war of secession, and subsequently to their abolition, as medical store-keepers. Their work is essentially related to the purchase and purveying of medical supplies.

In order to give you a more comprehensive view of what is required of the non-commissioned officers of the Hospital Corps, I hand you herewith a copy of the questions asked in the written examination recently undergone for promotion to the grade of hospital steward. It will be understood that in addition to this written examination each candidate is required to pass a practical examination in the following subjects: Physical condition; character and habits, especially as to the use of stimulants and narcotics; discipline and control of men, knowledge of regulations, nursing, dispensary work, clerical work, principles of cooking and mess management, hospital corps drill, minor surgery and first aid, including extraction of teeth.

It is hardly to be supposed that the course of instruction in any school of pharmacy would enable its graduates to pass this examination, and our experience has taught us that such is the fact. Hence it is that the law requires at least a year's service in the lower grades before promotion to the higher. The position of non-commissioned officers of the Hospital Corps is one of responsibility and entitles the holder thereof to respect which, I am happy to say, is almost universally conceded to him throughout the service. They have the same opportunities of promotion to the commissioned grade as any other enlisted men, of which many of them have taken advantage—some of them having, after a course in medicine, won an appointment as assistant surgeon U. S. Army, and others as lieutenants in the line.

Trusting that the foregoing will give you a clear understanding of the situation from the standpoint of this office, I remain,

Very respectfully,

(Signed) W. A. FORWOOD,
Surgeon General U. S. Army.

The following was the last examination for applicants for the positions of U. S. Army Hospital Steward as received from the Surgeon General:

PHARMACY.

H. S., May, 1902.

1. What determines the variations in the relative size of drops? What influence has the shape and surface of the vessel? Name some liquids producing very small drops; very large ones. Give your reasons in each case.

2. What do you understand by (a) calcination; (b) deflagration; (c) carbonization; (d) incineration; (e) sublimation? Give an illustration of each.

3. How much water must be added to two pounds of stronger ammonia water (28 per cent.) to reduce it to ammonia water (10 per cent.)?

4. Given three unlabelled bottles, how could you prove by physical and chemical tests which contained c. p. sulphuric, which c. p. hydrochloric, and which c. p. nitric acid?

5. What means are generally used to prevent the decomposition of *syrupus ferri iodidi*?

6. Name as many of the more important drugs mentioned on the supply table derived from the products of the destructive distillation of wood (cellulose and lignin) and of the dry distillation of bituminous coal, as you can remember. Give their uses and ordinary doses.

7. What menstruum is employed in making a tincture from each of the following drugs: Aconite root, colchicum seed, capsicum, buchu, nux vomica, catechu, digitalis, physostigma, yellow cinchona, guaiac (ammon. tincture), myrrh and gelsemium?

8. Name all the salts of the alkaloids on the supply table you remember, and give the maximum and minimum doses for adults, when given by the mouth. To guard against the decomposition or the formation of dangerous compounds, what drugs should not be prescribed with alkaloids or their salts?

9. What objection, if any, exists to the following prescriptions?

R Potass. chloratis 15
 Aluminis 4
 Glyccrini 30
 Aquae 90

S. 4 c. c. q. 3 hours.

R Tinct. Iodi 8
 Glycerini 8
 Aquae ad..... 60

S. For swabbing the throat.

R Morphinae sulph.13
 Sol. potass. iodidi sat..... 15

R Hydrarg. chlor .mit..... 1.95
 Acid hydrochlor. dil..... 5.75
 Syrup rhei arom..... 30
 Aquæ.....ad. 60

S. 3 Cc. in the afternoon and on going to bed.

10. Define resins, oleo-resins, gum resins, balsams, fixed oils. Give an example of each and state in what menstruum they are soluble.

MATERIA MEDICA.

H. S., May, 1902.

1. State all you know of the medicinal properties of the inorganic and the organic acids now on the supply table, as you can remember. Give examples of each.

2. Explain as fully as you can the following terms used in medicine: antipyretics, motor-excitants, motor-depressants, vaso-dilators, mydriatics, styptics, rubefacients, narcotics, antitoxines. Give one or more examples of each, and the diseases in which employed.

3. What is ichthyol? To what element does it owe its value in medicine? In what diseases has it been found useful?

4. What is croton oil? What are its medicinal properties? In what conditions may it be employed internally? Externally? Is it a volatile or fixed oil? How does its action differ from that of castor oil?

5. State what you know of the medicinal properties of iodoform, eserine sulphate, chrysarobin, guaiacol carbonate, santonin.

6. What is understood by the term "cumulative action," and "idiosyncrasy?" In what way do they effect dosage and mode of administration? Give some examples.

7. State what you know about iodine, its source, physical appearance, solubility, chemical tests, and official preparations. How does it affect the system if too long continued?

8. State all you know of the sources of salicin, salicylic acid, salol, salophen. What are their medical properties, and their maximum and minimum doses for adults? Name some of the diseases in which each is particularly useful.

9. Give the maximum and minimum doses of the following medicines hypodermically injected: sulphate of morphine, sulphate of atropine, hydrochlorate of apomorphine, digitalin, nitroglycerin, hydrochlorate of pilocarpine, hydrochlorate of quinine, sulphate of strychnine.

10. Define the terms antiseptics and disinfectants. Name those furnished by the medical departments, and give as full a description as you can of the particular use and mode of application of each.

ARITHMETIC.

H. S., May, 1902.

1. Simplify $\frac{\frac{3}{5} \times 1.25}{5\frac{1}{4} - 4.25}$. Express the result both as a common and as a decimal fraction.

2. One invests \$22,080 in railway stock at 4 per cent. discount. If the stock pays a 4 per cent. dividend semi-annually, what will be the income, and what rate will it be on the investment?

3. One buys oranges at 15 cents per dozen, and retails them at 3 for 5 cents: what is the profit?

4. One buys an article by avoirdupois weight and sells it at the same price per pound Troy weight; what is the per cent. of gain or profit?

5. The diameter of a cylindrical vessel is 42 centimeters, and its depth is $6\frac{1}{2}$ decimeters; how many liters of water will it hold, and how many kilos will the water weigh?

6. January 1st a commission merchant received 5,000 pounds of butter to be sold on commission, and advanced \$500 on it. January 18th he sells the butter at 25 cents per pound on 30 days time, and advances \$100 more. The rate of commission is 1 per cent. How much does the merchant still owe, and when is it equitably due?

7. Find the cost of a draft on Chicago for \$1,000 at 60 days sight, money being worth 5 per cent. and exchange at $1\frac{1}{2}$ per cent. premium.

8. What is the premium on a building worth \$3,000, insured for $\frac{2}{3}$ of its value at $2\frac{1}{4}$ per cent.?

9. One owns $\frac{3}{11}$ of a farm worth \$15,422, and sells $\frac{2}{3}$ of his share. Find the value of what he has left.

10. A cask of molasses containing 120 gallons cost \$50. $\frac{1}{5}$ of the molasses leaked out. For how much must the remainder be sold per gallon to gain 10 per cent, on the purchase?

ELEMENTARY HYGIENE.

H. S., May, 1902.

1. State minutely how you would proceed to disinfect a bed-room, with its ordinary contents, which has been occupied with a case of small-pox?

2. What diseases may be communicated to man by the medium of (1) water, (2) food, (3) air, and (4) insects?

3. Discuss the various methods of cooking—boiling, roasting, stewing and frying—from the sanitary standpoint.

4. State the precautions you would take to prevent bed-bugs getting into a hospital, and the various measures you would resort to for their extermination if found to be present.
5. State exactly how you would care for a case of typhoid fever so as to prevent the spread of its infection, minutely describing the disinfection of the excreta.
6. State how much floor space and cubic air space, and how much fresh air per hour, should be allowed as a minimum to patients in a hospital.
7. Describe fully a simple method of ventilating and keeping a temporary frame hospital ward, accommodating twenty patients, during winter in a cold climate.
8. Discuss the value of camp police in the prevention of camp diseases.
9. State exactly how you would proceed, in the field, to render a water of suspicious character safe and palatable to drink.
10. What measures would you suggest to stamp out an epidemic of typhoid fever occurring in a camp of mobilization and instruction?

CARE OF SICK AND WARD MANAGEMENT.

H. S., May, 1902.

1. (a) Describe briefly the methods of giving a sweat bath. Give the indications for its use and note any risk associated therewith.
- (b) Enumerate the different varieties of enemata. Give the formula for a nutritive enema, and describe the preparation of the patient for its administration.
2. (a) What are the important essentials in the nursing of a case of acute articular rheumatism?
- (b) What complications should the nurse be on watch for in diphtheria?
3. What symptoms in a typhoid fever patient would lend you to suspect intestinal perforation? What would be your course until a physician could be called?
4. Describe the following terms: Cheyne-Stokes breathing, dyspnoea, orthopnoea, ascites, haemoptysis, haematemesis, oedema, asphyxia, ecchymosis, hemiplegia.
5. What symptoms would lead you to suspect the beginning of coma in a case of diabetes? Which form of food is restricted in a case of diabetes, and for what reason?
6. Name the food principles. Give the uses of each in the body.
7. Trace the changes which take place in a baked potato, from the raw state until utilized by the body.
8. Describe the method of making a loaf of bread. How should you bake and care for the loaf of bread after baking?
9. Name a properly balanced bill of fare for three days, for a patient on light diet; give the amount of each food to be used.
10. How would you prepare a breakfast?

MINOR SURGERY AND FIRST AID.

H. S., May, 1902.

1. Give the contents of the first-aid packet: where it should be carried by the combatant soldier, and in detail how it should be used by himself in dressing a g. s. w., m. t., of his own r. thigh.
2. Give the contents of the hospital corps pouch. By whom is it carried, what of its contents will be used in the first-aid treatment of a simple fracture of the l. clavicle, m. t., and how?
3. Give the contents of the orderly's pouch. By whom is it carried, by whom used? Describe briefly the organization and duty of the first line of medical assistants on the battle-field.
4. Describe the hand litter, giving dimensions. How many are available for each regiment? Name the commands laid down under "Manual of the Litter." Describe the "Vertical Position."

5. Describe the ambulance, and give an outline of regulations relating to it as set forth in army regulations, ed. 1901. Give all the commands laid down in Drill Regulations, h. c., pertaining to the ambulance.

6. How may ordinary wagons be prepared for the transportation of wounded? What is said of this in the Drill Regulations, h. c.?

7. Describe a hospital tent, and the way it is pitched and set forth in Drill Regulations, h. c.

8. A dressing station having been arranged for instruction of the men of the h. c. and the detachment being in line of litters at the carry, the instructor commands "Search for the wounded, march." Give and describe the execution of every command necessary to bring a litter to a soldier, presumed to be suffering from a g. s. fracture r. thigh, m. t. bullet lodged and hemorrhage copious. State what should be done for the patient, and give the regulation command to place him upon the litter and bring him back to the dressing station, passing en route a deep, wide ditch, and loading into and unloading from an ambulance.

9. How would you prepare the operating tent of the regimental field hospital, the patient, instruments, dressing, etc., for a celiotomy?

10. From whence would you obtain the material for a regimental field hospital? Describe such an organization, giving personnel and equipment.

The six subjects are all arranged in ten sections each. There are approximately the following number of questions on each subject:

Pharmacy	53
Materia Medica.....	67
Arithmetic.....	13
Hygiene.....	19
	152
Care of sick and ward management.....	36
Minor Surgery and first aid.....	30
	66

In Dr. Forwood's reply to our letter it will be noted he argues against a commission for the Army Hospital Steward: the subject of commissions was not referred to in our letter at all. How he calculates the pay of the Army Hospital Steward at \$100.00 per month, we do not know; after years of service the Army Hospital Steward can secure \$45.00 per month and up to \$50.00 in some cases. Dr. Sternberg claimed that his allowances were about \$30.00, which would make a total of about \$80.00 a month. The veterinary surgeon of the army is better paid than the hospital steward who carries life or death in his hands, and even mail carriers get \$100.00 per month. The Hospital Steward of long service if a good business man would have soon owned a store of his own, if he had staid in private life, and have easily made over double his present salary. The argument reminds one of the old saying: "It needs a good salary to get a good man for my place, but I'll get one as cheap as I can to fill yours." As a matter of justice to Dr. Forwood we wish to say that we infer that he did not have an opportunity to take up this matter as fully as he might have desired, as he is just going upon the retired list. His courteous and kind reply to our letter makes us feel that he would have met our wishes in some degree at least if he had remained as Surgeon General long enough to carry out such changes. The new Surgeon General of the army (Dr. O'Reilly) we have been informed through mutual friends, feels most kindly towards the Army Hospital Stewards, and the pharmacists of the United States, and their wishes for proper recognition in the United States Army. The situation looks encouraging.

In the Navy, as the Association is well aware, we have secured for the former Naval Apothecaries, who ranked just above the negro cook, the title of pharmacist, and the rank of a warrant officer. The warrant officer is saluted by all the petty officers, and ranks next to the commissioned officers. He secures about the same salary as the 2d

lieutenant on land. Since obtaining the rank of warrant officer for the Naval Pharmacist, additional legislation has been passed further advancing the other warrant officers, but ignoring the pharmacists. This is a matter which we trust will be rectified at an early date, as the act which created warranted pharmacists in the United States Navy distinctly provided, section 4 of act of June 17, 1898, "That all benefits derived from existing laws, or that may hereafter be allowed by law, to other warrant officers or enlisted men in the navy shall be allowed in the same manner to the warrant officers or enlisted men in the hospital corps of the navy." Later on came what is known as the Naval Personnel Bill of March 3, 1899, which provides, section 12, "That boatswains, gunners, carpenters and sailmakers shall, after ten years from date of warrant, be commissioned chief boatswains, chief gunners, chief carpenters, chief sailmakers, to rank with, but after ensign," and also section 26, "*That all acts and parts of acts, so far as they conflict with the provisions of this act, are hereby repealed.*"

The Naval Department, upon being requested to give their opinion upon this subsequent act, and if it does not confer upon the warranted pharmacists of the navy the rank of commissioned pharmacists, ranking with, but after ensign, according to the provisions of the Act of 1898, which bestowed upon them all of the future benefits which might be conferred upon other warrant officers, replied as follows: "Upon critical examination of section 4 of the Act of June 17, 1898, in connection with section 12 of the Personnel Act, the Department is of the opinion that the general provisions of the former must be regarded as modified by the specific provisions of the latter enactment, in so far as conflict may be found to exist between them; and that Congress, having explicitly provided for the advancement of boatswains, gunners, carpenters and sailmakers, and having omitted to make such provision in the case of pharmacists, the Department cannot by construction extend such specific enactment beyond its terms."

Many matters regarding Navy personnel were brought up at the last session of Congress; none got anywhere however, on the general understanding that the whole subject of Navy personnel would be taken up for consideration at the next session. We believe that the present Surgeon-General feels friendly towards the pharmacists of the Navy, and it is very probable that the naval pharmacists will be taken up when the others come before the committee.

Dr. Rixey, Surgeon-General of the United States Navy, recently sent a communication to the chairman of our committee, who holds the position of Secretary of the Georgia State Board of Pharmacy, and requested copies of the Georgia State Board of Pharmacy examinations. These were no doubt to be used both for comparison and selection, and similar requests were very probably addressed to the secretaries of all the other state boards of pharmacy. The following reply was made to Dr. Rixey's request:

DR. D. S. RIXEY, *Surgeon-General, U. S. Navy, Washington, D. C.:*

Dear Doctor: We take pleasure in sending you a set of our examination papers of the Georgia State Board of Pharmacy as requested by you a few weeks ago. We would have sent them sooner but for absence from the city. If you wish others we can send them.

It certainly gives us great pleasure to note that the Naval Department is referring to pharmacists in regard to pharmaceutical matters. It is the general custom in the U. S. service for medical officers to examine the pharmacists. When one has studied both medicine and pharmacy and realizes how different is the training of the two classes of men, he cannot consider it proper that pharmacists should be examined by only medical officers. If, as some medical officers claim, the dispensing is limited chiefly to a few tablets, it is probably proper for medical officers only to examine the pharmacists, as in such cases the pharmacist is really only the assistant of the medical officer, and the medical officer is not entitled really to be so called if his capacity does not extend beyond the ready-made prescriptions of the manufacturing pharmacists. Up-to-date pharmacists, however, can with much intelligence aid the medical officer in lines with which the medical officer is not at all familiar, if the regulations are such as to give scope and opportunity to the work of such men. We have long thought that the examinations of water supplies and of food in the service should be a part of the work that is turned over to the pharmacists. Any other assistance that we can give you in this matter of examinations we will take pleasure in giving.

The U. S. Navy has been the foremost of the three departments in properly recognizing pharmacy.

This has been a source of much gratification to us. We have been all our lives an advocate of a strong Navy, and when the former surgeon-general of the Navy was disposed to grant better recognition to pharmacists, and eliminate the foreign element from the Navy, we felt that the service was getting nearer and nearer in touch with the people. We are sure that our Navy is now more popular than it has ever been with the public. The pharmacists of the U. S. stand ready to co-operate with the medical men for further recognition of both medical officers and pharmacists.

Wishing you every success and prosperity under your administration, we remain,

Yours respectfully,

GEORGE F. PAYNE.

When we began our work the apothecary of the United States Navy secured as his best salary \$60.00 per month, and ranked next to the negro cook.

The pharmacist of the United States Navy now ranks next to the commissioned officer, and is saluted by all the petty officers, and has excellent prospects of a commission at an early date.

As the following recommendation was made on March 31st of the present year by Surgeon-General Rixey to the Secretary of the Navy, "In view of the large increase in the number of ships, stations, and personnel of the Navy and Marine Corps, the Bureau earnestly recommends an increase in the number of pharmacists from twenty-five, as now allowed, to fifty, and also the extension of the provisions of Sec. 12 of the Act of March 3, 1899, entitled 'An act to reorganize and increase the efficiency of the personnel of the Navy and Marine Corps of the United States,' that it may include pharmacists of the Hospital Corps of the Navy," the pay of the naval pharmacist is now as follows:

PRESENT PAY TABLE PER ANNUM.

	At Sea.	On Shore.	Waiting Or.
After 3 years.....	\$1200 00.....	\$900 00.....	\$700 00
After 6 years.....	1300 00.....	1000 00.....	800 00
After 9 years	1400 00.....	1300 00.....	900 00
After 12 years.....	1600 00.....	1500 00.....	1000 00
After 13 years.....	1800 00.....	1600 00.....	1200 00

Pharmacists certainly have cause to be proud of our beautiful and efficient Navy and the disposition of its medical service to properly recognize pharmacy.

During the session of Congress just adjourned, we did a large amount of active and energetic work, particularly for the advance of the hospital stewards in the Marine Hospital Service. There was some work done in the interest of the pharmacists in the Army and Navy, but our main efforts were for the advancement of the Marine Hospital Service pharmacists. We labored faithfully with the Surgeon-General of the Marine Hospital Service, the Secretary of the Treasury (under whose department the Marine Hospital Service is administered), with Congress, and with the President himself.

We took advantage of the occasion of a bill being introduced by friends of the Surgeon-General for an advance in his salary and his status, and we endeavored to secure the passage of the following amendment:

Amendment to S. 2162 and H. R. 7189. (A bill to increase the efficiency and change the name of the United States Marine Hospital Service.)

Amend by striking out the words "Hospital Stewards" on page 2, line 1. Add as a new section the following:

"That the President shall appoint and commission the Senior Hospital Stewards of the Marine Hospital Service now serving as such, 'Pharmacists United States Health Service,' with the relative rank of and after 2d Lieutenants of the Army and Ensigns of the Navy, with an annual compensation of \$1,200.00, and 10 per cent. increase for each five years of service and present perquisites.

"That new appointments to the grade of pharmacist shall be made from the list of Hospital Stewards after three years of satisfactory service as such, and after due examination in the various branches of their profession by a board composed of medical officers and pharmacists of the service equally divided."

The Surgeon-General conceded us the title of Pharmacist on February 1st of this year. Pharmacists have always objected very seriously to the title of "hospital steward," for pharmacists in the public service are men who are required to be graduates, and this change of title we consider quite an advance. It was promised us more than two years ago, but only recent active work secured it for us.

The Surgeon-General of the Marine Hospital Service, now called the "Public Health and Marine Hospital Service," secured the passage of the bill increasing his own salary from 4000 to 5000 dollars per annum.

The following correspondence which we have recently had with the President explains some of the work in which we have very recently been actively engaged:

[Copy.]

ATLANTA, GA., Aug. 5, 1902.

THEODORE ROOSEVELT, *President of the United States, Oyster Bay, R. I.*:

Mr. President: We note that the Surgeon-General of the Marine Hospital Service has secured his advance in salary, and other recognition which he desired for the Service, at the hands of Congress. We trust that his success will have a tendency to cause him to feel inclined towards better regulations as regards the salaries of the Pharmacists of the Marine Hospital Service. The Pharmacists of the United States are deeply interested in proper recognition of their profession in the Public Service, but at present the pharmacists are so poorly organized officially that they are far out-ranked by those of other civilized countries of the world, with one exception.

We understand that you have authority to take up the matter of the New Regulations, soon to be issued by the Surgeon-General of the Marine Hospital Service, and the pharmacists of the United States will appreciate it very much if you will cause the Surgeon-General to accord better recognition to the Marine Hospital Pharmacists, and to concede them in the revised Regulations:

- 1st. Accumulative leave, the same as now allowed the Medical officers.
- 2nd. More specific detail of their clerical duties.
- 3rd. Baggage allowance increased to 1,000 pounds.
- 4th. A detail of five pharmacists from the list of the corps to represent the service at the American Pharmaceutical Association Semi-Centennial Meeting at Philadelphia next September, from 8th to 15th.
- 5th. That a Pharmacist of the Service be on the Examining Board for the promotion of Junior Pharmacists.
- 6th. That commutation for quarters be increased to \$40.00 a month.
- 7th. That Junior Pharmacists shall receive \$900 per annum, and Senior Pharmacists receive \$1,200 per annum, and 10 per cent. increase for each five years' service be allowed up to 40 per cent. When placed on "Waiting Orders" to receive 75 per cent. of their pay while so placed.
- 8th. To alter the uniform regulations for pharmacists—that is: Change them to a UNIFORM which will not be mistaken for that of a street-car conductor, or a street cleaner, or a porter, or a bar-tender (in white).

The pharmacists of the United States are more interested in better organization than ever before in the history of our country. In every State in the Union an active campaign is going on for thorough organization of the Pharmaceutical Associations. There is not a town of any size but what has active work going on in this line. There is also a State Association in every State, two large National Associations and one American Association. The pharmacists appreciate the tremendous changes taking place in the United States, and the process of evolution through which we are passing, and your name is held in the highest esteem by pharmacists throughout the Union. We have not forgotten your past friendliness to our cause on several occasions.

We have written letters on this subject to the Surgeon-General of the Marine Hospital Service, to the Secretary of the Treasury, as well as yourself, and trust the forthcoming Regulations will give proper recognition to pharmacists of the Marine Hospital Service, which is so earnestly desired by the 150,000 pharmacists of the United States—men who are prominent and influential in their respective communities.

We have a semi-centennial of the American Pharmaceutical Association in Philadelphia on the 8th to 15th of next September. It will be the largest meeting we have ever had, and, from present indications, we will have by far the largest list of new names for membership ever known. They are pouring in from all States, and as Chairman of the Committee for the Advancement of Pharmacists in the Service of our Government, it would give me the greatest pleasure to be able to state at the meeting that this much-desired recognition had been accorded to the pharmacists of our Marine Hospital Service.

We have already, at this early date, received notices that there will be more than 1,000 pharmacists in attendance at this meeting, so we have every reason to expect a much larger one.

In every village, town and city of our broad country there are pharmacists, who are among the prominent

and leading men in every community, and any consideration shown them in this matter will be always deeply appreciated.

Very Respectfully,

GEORGE F. PAYNE,
*Chairman, Special Committee of American Pharmaceutical Association,
and Vice-President of the American Pharmaceutical Association.*

[Copy.]

[Reply.]

WHITE HOUSE—WASHINGTON, }
OYSTER BAY, N. Y., Aug. 9, 1902. }

My Dear Sir: I beg to acknowledge the receipt of your letter of the 5th instant, and to state that the President has at once taken the matter up to see what, if anything, can be done concerning the matter of which you write.

Very truly yours,

(Signed) WM. LOEB, JR.,
Acting Secretary of the President.

DR. GEORGE F. PAYNE, *Atlanta, Ga.*

OYSTER BAY, N. Y., Aug. 16, 1902.

My dear Sir: Referring to your favor of the 5th inst., the President directs me to forward to you the enclosed papers, which explain themselves. After reading them please return them to me.

I am, very truly yours,

(Signed) WM. LOEB,
Acting Secretary to the President.

DR. GEORGE F. PAYNE, *Atlanta, Ga.*

[Copy.]

WASHINGTON, D. C., Aug. 13, 1902.

TO THE PRESIDENT:

Sir (through the Honorable the Secretary of the Treasury): In response to your request through your acting secretary, Mr. Wm. Loeb, Jr., of August 9th, I submit to you herewith a report upon the enclosed letter from Dr. George F. Payne, of Atlanta, Ga.

When the bill entitled "A Bill to increase the efficiency and change the name of the marine hospital service," which became a law last July, was introduced, the hospital stewards of the service, in conjunction with Dr. Payne, started a movement for an amendment in the interest of the hospital stewards, a copy of which follows:

"Amend by striking out the words 'hospital stewards' on page 2, line 1. Add as a new section the following:

"That the President shall appoint and commission the senior hospital stewards of the Marine Hospital Service, now serving as such, 'Pharmacists United States Health Service,' with the relative rank of, and after 2d lieutenants of the Army and ensigns of the Navy, with an annual compensation of \$1,200, 10 per cent. increase for each five years of service, and present perquisites.

"That new appointments to the grade of pharmacists shall be made from the list of hospital stewards after three years of satisfactory service as such, and after due examination in the various branches of their profession by a board composed of medical officers and pharmacists equally divided."

In response to a request from the chairman of the Committee on Public Health and National Quarantine of the United States Senate as to the merits of this amendment, I transmitted a letter approved by the Secretary of the Treasury, a copy of which I enclose.

Congress took no action on this proposed amendment.

I believe the matter is made plain by the correspondence referred to.

The pecuniary compensation of the pharmacists of the Service is a matter left for regulations, and for certain reasons connected with the travel to which they are subjected there is a contemplated change in the present regulations increasing somewhat their present compensation, and this was determined upon entirely independent of the letters received from Dr. George F. Payne. I believe that the matter will be arranged in a just and proper manner.

Respectfully,

(Signed) WALTER WYMAN, *Surgeon-General.*

[Copy.]

ATLANTA, GA., Feb. 6, 1902.

HON. GEORGE G. VEST, *Chairman Committee on Public Health and National Quarantine, United States Senate:*

Sir: I have the honor to acknowledge the receipt of your letter of Jan. 22d, enclosing a copy of a bill introduced by Senator Perkins (S. 2162), together with a copy of an amendment thereto, and requesting my opinion of both the bill and the amendment.

My opinion of the bill was transmitted to you on the 4th inst.

With regard to the amendment, I have to review its provisions as follows:

It provides:

1st. That Senior Hospital Stewards of the Marine Hospital Service shall be appointed and commissioned by the President.

- 2d. That they shall be termed Pharmacists.
- 3d. That they shall have relative rank with lieutenants of the Army and Ensigns of the Navy.
- 4th. That their compensation shall be \$1,200 per annum, with five per cent. increase for each five years of service, and present perquisites.
- 5th. That new appointments to the grade of Pharmacist shall be made from the list of hospital stewards after three years of service and after examination.

In commenting upon the above, I would first state that there are at present no hospital stewards in the Marine Hospital Service. By circular letter of the Department, dated Feb. 1st, and approved by the President, the title of "Hospital Steward" has been changed to that of "Pharmacist," and this, notwithstanding the fact that pharmacy is a very inconsiderable portion of their duties.

As showing the duties of hospital stewards (now pharmacists), I enclose copy of Treasury Circular, dated Nov. 15, 1899, giving their duties, how they are appointed, and their compensation.

Their title has been changed for the reason that the word "steward," frequently used in connection with very honorable positions, was a distinct disadvantage to the hospital stewards of the Marine Hospital Service in their supervisory function over hospital attendants and patients in marine hospitals. These hospitals receive the sick and injured from the merchant marine, and on vessels of this class the term "steward" is universally applied to the cook, and it was found in consequence the influence of the hospital steward in his control of patients and attendants was impaired. Since the hospital stewards were required to be graduates in pharmacy, and no other title appearing preferable, it was determined, after careful consideration, to change their titles to pharmacists, although their duties, by the same circular, are declared to be the same as heretofore performed by hospital stewards.

In my opinion, this change is all that is required at present, the matter of compensation being one subjected to Department regulations. No corresponding officers in the Army or Navy have relative rank, and it is unnecessary that they should be commissioned by the President. Pharmacists in the Navy are warrant officers, appointed by the Secretary of the Navy, and are not in line of further promotion. Hospital Stewards in the Army are enlisted men.

Some time ago this matter was brought to the attention of the Bureau through several members of Congress, who forwarded letters relating to the hospital stewards of the Marine Hospital Service. These letters were, most of them, misleading, leaving the inference that the salaries as provided in the regulations, beginning with \$600 per annum and ranging as high as \$864 per annum, were the only compensation received, whereas, as will be seen by the circular, these gentlemen have well-furnished quarters for themselves and families, with all housekeeping appurtenances. They are furnished with fuel, light and water, and the laundry work is performed for them. Their quarters are taken care of by hospital attendants, so that practically they have no servant's hire to pay. They are entitled to medicines and surgical appliances, and always have the services of well-qualified physicians—the medical officers of the Marine Hospital Service—for attendance on themselves and families.

In other words, nearly every expense of living, excepting clothing, is furnished to the pharmacists, and this, in addition to their pecuniary compensation, is considered fair reward for their services.

The sum proposed in the amendment, together with these allowances, would cause their compensation to be greater than that allowed to junior medical officers.

There has been no difficulty, greater than that arising with other classes of employees, in obtaining, through the Civil Service Commission, all the hospital stewards needed.

With the change of title, as before stated, it is believed that the only reasonable objection to their status has been removed, and I recommend that the amendment be not accepted.

Respectfully, (Signed) WALTER WYMAN,
Surgeon-General M. H. S.

Approved: (Signed) L. M. SHAW, Secretary.

[Copy.]

AMENDMENTS TO REGULATIONS, U. S. MARINE HOSPITAL SERVICE. 1902.

DEPARTMENT CIRCULAR NO. 13.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON-GENERAL, M. H. S.,
WASHINGTON, D. C., Feb. 1, 1902.

To Commissioned Officers, Acting Assistant Surgeons, Hospital Stewards and Others Concerned:

The following amendments are hereby made to the Revised Regulations of the Marine Hospital Service, approved Nov. 29, 1897, namely:

Article 1 (organization), paragraph 1. This paragraph is hereby amended by striking out the words "hospital stewards" and inserting in their place the word "pharmacists."

All other paragraphs of the regulations of the Marine Hospital Service containing the words "hospital steward" or "hospital stewards" are hereby amended by substituting therefor the word "pharmacist" or "pharmacists."

Attention is called to the fact that under the regulations, as above amended, pharmacists of the Service are required to perform all the duties heretofore required of hospital stewards.

WALTER WYMAN,
Supervising Surgeon-General, M. H. S.

Approved: O. L. SPAULDING, *Acting Secretary of the Treasury.*

WHITE HOUSE: Approved: T. ROOSEVELT.

[Copy.]

INFORMATION FOR CANDIDATES FOR APPOINTMENT AS HOSPITAL STEWARD IN THE UNITED STATES MARINE HOSPITAL SERVICE.

1899. DEPARTMENT CIRCULAR NO. 136.

TREASURY DEPARTMENT,
OFFICE OF THE SUPERVISING SURGEON GENERAL M. H. S. }
WASHINGTON, D. C., Nov. 15, 1899.

The following extract from the Revised Regulations of the Marine Hospital Service is hereby published for the information of applicants for appointment as hospital steward of that Service:

57. Hospital Stewards will be appointed by the Secretary of the Treasury upon the recommendation of the Supervising Surgeon General after passing a successful examination under the rules prescribed by the U. S. Civil Service Commission.

58. Applicants for this position must be graduates in pharmacy, furnish certificates of good, moral character, and pass a satisfactory physical examination. No applicant will be examined who is under 21 or over 30 years of age.

59. Hospital Stewards shall be divided into two grades, senior and junior, and original appointments shall be to the grade of junior hospital steward.

60. Promotions according to seniority of merit, will be made after three years' service, from the junior to the senior grade, after due examination on subjects connected with their official duties. Said examination shall be in writing, and the questions shall be prepared under the direction of the Supervising Surgeon-General. Previous to said examination the Supervising Surgeon-General shall cause to be sent to each officer under whom the said steward has served, a list of interrogatories which shall be answered by said officers and returned to the Bureau. If their record of efficiency, honesty and sobriety is not good, they will not be promoted.

73. The compensation of hospital stewards shall be at the following annual rates, viz: Senior hospital stewards shall receive \$720 per annum; junior hospital stewards shall receive \$600 per annum. At the expiration of five years of service they shall receive \$792 per annum, at the expiration of ten years' service they shall receive \$864 per annum.

74. Hospital Stewards, when on duty at United States marine hospitals or quarantine stations, shall be entitled to quarters, subsistence, fuel, lights and necessary laundry work, and when on duty at stations where there are no quarters belonging to the Service, they shall be entitled to commutation thereof at the rate of \$25.00 per month.

76. Hospital Stewards will be allowed medicines and surgical appliances in stock at the stations for themselves and families when sick.

134. The general duties of a hospital steward shall be to oversee the duties of the attendants, to report dereliction of duty among attendants to the commanding officer, to issue supplies to the attendants, to supervise the cleaning of the various buildings of the station, and to assist in preserving order in and about the buildings and grounds.

135. The senior and junior hospital steward will make daily inspection of the wards, kitchen and quarters of attendants, giving particular attention to cleanliness and proper preparation of food.

138. It shall be the duty of the hospital steward to inspect the meals of attendants and patients daily, and see that they are properly cooked and served and that order is maintained.

140. It shall be the duty of hospital stewards to procure the subsistence and other supplies as directed by the commanding officer, to keep a record, by weight and measure, of all the stores received, and also of the stores issued each day to the cook or patients or to stewards, and to compound and dispense such medicines as may be prescribed. Hospital stewards are not appointed to any particular station but to the general service, and are subject to change of station. When traveling under orders they are allowed actual expenses.

WALTER WYMAN,
Supervising Surgeon-General U. S. M. H. S.

Approved: L. J. GAGE, *Secretary.*

ATLANTA, GA., September 8th, 1902.

THEODORE ROOSEVELT, *President of the United States, Oyster Bay, N. Y.:*

Mr. President: I have received the papers which you so kindly directed to be sent to me through your secretary. I have read them with much interest and return them as requested. I regret that Dr. Wyman, in his communication to you, intimates that our work for the advancement of the pharmacists in the Marine Hospital Service is simply the work of myself and the Marine Hospital pharmacists. It is a

matter in which the American Pharmaceutical Association and every pharmaceutical association in the United States is deeply interested, as is evident from the resolutions which have been drawn up from time to time by the various state pharmaceutical associations and other pharmaceutical associations, endorsing the work of our committee, some of them even sending us voluntary contributions of funds to pay for stamps, stenographic work, etc. Every officer of our American Pharmaceutical Association has been an active worker in the interest of the proper recognition of pharmacists in our public service. I have received many trunkfuls of letters on the subject. The work of our committee was endorsed by the pharmaceutical associations of Georgia, New Jersey, Kansas, Kentucky, Indiana, Minnesota, Rhode Island, New York, Illinois, etc., in the order given. I at first kept the record and the date of these endorsements until the work became too heavy upon me. Others have steadily followed until I am pretty sure our work has the endorsement of every pharmaceutical association in the United States. The pharmacists of the whole country are a unit in desiring proper recognition for the pharmacists in our Public Health and Marine Hospital Service. It has been a considerable personal expense to me keeping up with the correspondence, and has consumed much of my time. I look upon the work as a matter of duty to my profession, my country, and the times in which I live. When I note the standing of pharmacists in the public service of other countries and their standing in the United States service during our Civil War, I fully realize that proper consideration is not now given pharmacists in our public service. I have never received, nor do I expect to receive, a single cent for my efforts in this matter. I have been requested and offered remuneration to take up another line of work for the advancement of others in the public service, which I have refused to do, stating I was working for the pharmacists as a duty to my profession and because I felt sure our government would properly recognize her pharmacists as soon as the true condition of affairs was understood.

When we took up this work for the Marine Hospital Pharmacists, we did not know a single marine hospital steward, army hospital steward, or naval apothecary. Our attention was most forcibly attracted to the matter upon visiting with a party of representative pharmacists, some of the ships of our beautiful White Squadron and asking for the apothecary. We were surprised to find that the apothecary barely outranked the negro cook. We also found that men were taken in our public service who were not citizens of the United States. They were taken because it was difficult to get American citizens as apothecaries at the salaries given. Matters have since been very much improved in our Navy, in which you materially aided us. We have now taken up the matter of the Marine Hospital Service. The pharmacists of the Marine Hospital Service are required to be graduates in pharmacy. Since we have urged the injustice of employing aliens as hospital stewards and apothecaries, and the practice has been discontinued (we do not know that any aliens were employed in the Marine Hospital Service, they were employed in the Army and Navy), the Civil Service Commission has stated that there are more vacancies than there are eligible applicants to fill them. In the recent examination for Marine Hospital stewards (now pharmacists) held in this city there was but one applicant. He failed to pass, fortunately for him, as he is now securing over double the salary he could have ever secured in the Marine Hospital service.

Dr. Wyman quoted, in his letter to you, the amendment which we tried to secure during the last session of Congress to Senate Bill 2162, which provided for increase in his salary and his rank. A favorable consideration of our amendment was prevented by Dr. Wyman, as we have been informed by our friends in Washington, for the reason freely expressed by himself that the consideration of the amendment would endanger the passage of the measure for his own increased salary and rank. There are now before Congress the following bills for the advancement of the status of the Marine Hospital pharmacists: S. Bill 4583, introduced by Senator O. Bacon, of Georgia; H. R. 12501, introduced by Hon. L. F. Livingston, of Georgia; and H. R. 15349, introduced by Hon. Henry C. Smith, of Michigan.

The pharmacists of this service are required to be professional men—graduates of colleges of pharmacy—and to pass rigid professional examination for admission to the service. They are required to be the executive officer, quartermaster, commissary and adjutant of every station in addition to their professional duties. By the regulations of the service the assistant surgeon now receives double the pay of a pharmacist and perquisites, which are fixed in value by the regulations at \$30.00 per month, or \$5.00 per month greater than the total valuation of the pharmacists' perquisites. The pharmacist draws a plain ration and plain laundry work for *himself only*, which does not include his family. The assistant surgeon can at any time draw the same ration for approximately thirty cents per day under authority of the regulations. Furthermore, when on "special duty" the medical officer draws his special allowance for expenses of subsisting, laundry work, etc., almost without limit.

Very few of the stations provide "well-furnished quarters" or "commodious quarters." In some locations the quarters are much cramped, one and two rooms being the limit in several places, while the medical officers have from four rooms to a whole house.

The furniture with which the average pharmacist's quarters are supplied usually consist of cast-off lots of the medical officers, their places being usually replaced by new goods—for if there is an old carpet, rug, or other articles that are hardly ready for the condemned room, the Pharmacists' quarters get the same to finish it up.

Laundry work is not allowed for the Pharmacist's family. Their quarters are not taken care of by an attendant, when the pharmacist is a married man, and if he be unmarried, all the service he gets from an

attendant is the simple making of a bed or sweeping of the floor. Most of the married pharmacists employ a servant to care for their quarters and cook for their families, as the regulations forbid a cooked ration being served to married pharmacists. The statement that hospital attendants care for the pharmacists' quarters is surprising in view of Dr. Wyman's own regulations. Possibly some of the single pharmacists may utilize them for this purpose without any authority by regulation, in the same manner that the medical officer takes advantage of his opportunities. If Dr. Wyman will officially notify the pharmacists that they are entitled to all domestic service or allow them the money value of the perquisites as pictured to the American Congress, he will do much towards eradicating the bitter feeling of the pharmacists. The work of pharmacists under the regulations is one of responsibility and of life and of death. He is an executive officer, whose close attention is required to the details and management of the hospital. He is responsible to the doctor in charge, and, therefore, much of his work is rendered obscure by this simple fact, for much of the hospital management directly falls upon the pharmacist. The one item of procuring subsistence for the hospital attendants and patients is one that involves many thousand of dollars in a year's time.

Paragraph No. 74 of the Revised Regulations, 1897, states that: "When on duty at U. S. Marine Hospital or quarantine stations where there are no quarters belonging to the service they shall be entitled to commutation at the rate of \$25.00 per month in lieu of subsistence, fuel, lights, necessary laundry work, and quarters." It is then therefore obvious what the Surgeon-General regards as a just amount for these allowances. The Surgeon-General states there has been no special difficulty, any more than that in other branches of Civil Service in securing eligibles, and I beg to quote from the Manual Examinations, Form 302, revised to Jan. 1, 1902, page 80, section 141, which states: "In the past the number of eligibles obtained has not been sufficient to meet the demands of the Service."

The experienced Marine Hospital Pharmacist with his wide attainments deserves as much or more compensation than a newly-appointed Assistant Surgeon who has all to learn, and incidentally, the very one who gets much aid in hospital management, when the new junior officer is in charge of a station, and is left to advise with the pharmacist "what to do." The pharmacists of this service are subject to change of station just the same as the medical officers: are subject to the same dangers of yellow fever, small-pox, cholera, or plague whenever a camp is established for detention of same: and they cannot accumulate means like the citizen who is permanently located. Many of the pharmacists of the service have spent the best years of their lives devoted to their duty, there is no provision existing for them should they lose their health permanently, and as a body of men, their calling brings them in contact with all kinds of infectious diseases. They should have a just recognition for their services, but at present the medical officers get the cream of the salary appropriations: they are provided for by "waiting orders," with 75 per cent. of their pay while so placed, in case they are sick or disabled—why should not the pharmacist, whose position is so closely related to the doctor, be accorded some just consideration? The pay of the medical officer begins with \$1600 with quarters, ice, fuel, etc., and rises gradually to Surgeon at \$3500 with the same allowances.

The pharmacist begins with \$600, quarters, fuel, lights, water and subsistence for *one* and its maximum is \$864 after ten years' service. The subsistence will in no case exceed \$9 to \$12 per month, and is not allowed in a number of the stations of the contract class.

We are asking that the junior pharmacist begin at \$900 and the senior pharmacist at \$1200 annually. If a graduate in pharmacy and a graduate in medicine enter the service at the same time, the junior pharmacist will then begin on a \$900 salary, whereas the assistant surgeon now begins on a \$1600 salary. The pharmacist after serving a term of twenty years as senior pharmacist will finally secure \$1680 and the surgeon \$3500 annually. In other words, the best salary we are asking for the long experienced senior pharmacist ends almost where that of the inexperienced assistant surgeon begins. This small increase asked by the pharmacists of the United States for the 42 Marine Hospital pharmacists, including seniors and juniors, will not come from the Treasury but from the funds of the Marine Hospital Service, which is largely supported by a tonnage tax on foreign vessels. We are informed that at one time very recently there was nearly one million dollars surplus from this tax.

The letters received during the past seven or eight years at the Surgeon-General's office if kept on file will show how earnestly this advance is desired by the pharmacists of the United States. This is not a partisan matter, and with the strong influences at work to unify and bind our great country together in closer bonds of brotherhood and union than ever before, and with the better understanding and appreciation of the sections for each other, the time is opportune for this recognition of pharmacy. The mighty enthusiasm of Maine and Vermont vibrates in a ringing response in the hearts of the pharmacists of the Union for a Chief Executive who can find the opportunity at such a time to consider their requests.

We will greatly appreciate your causing regulations to be issued giving the American Pharmacist a status to compare with that of other civilized countries. We thank you in the name of the American Pharmaceutical Association and of the Pharmacists of the United States for the courtesy you have already shown us in this matter.

Very respectfully,

GEORGE F. PAYNE, *Chairman.*

P. S. We also call attention to the additional expenditures required of the pharmacists in the service; the distinct uniforms to be purchased; the expense of moving a family from one end of the country to the other on 36 hours' notice on an average of two years or less. Furthermore, a pharmacist in civil life, with

the ability and education required of his service brother, with reasonable application would be in a position of trust before the expiration of three years' service, and would probably be the proprietor of a business. Where could the young medical officer find an opening outside of the service that would bring him \$1,600, *a furnished home* and the other perquisites within three years or even ten years after his graduation?

This is the way the matter now stands:

<i>Medical Officers.</i>		<i>Pharmacists.</i>	
Assistant surgeons	\$1600 00	Pay. Junior pharmacists	\$600 00
P. A. surgeons	2000 00	Senior pharmacists	720 00
Surgeons.....	2500 00	After five years' service	792 00
Surgeon-general	5000 00	After ten years	864 00
And 10 per cent. increase for each five years' service, up to 40 per cent.		No increase to above pay table.	

QUARTERS.

Surgeons—four rooms, or in lieu thereof \$50.00 per month additional.	One room, or in lieu thereof \$2 per month.
P. A. surgeons—three rooms, or in lieu thereof \$40.00 per month.	
Assistant surgeons—two rooms, or \$30.00 per month.	

Fuel, lights, water and ice are allowed in each case.

RATIONS.

Medical officers do not receive rations while on duty at hospitals, but do when serving on board quarantine vessels, in camps, on revenue vessels; and while serving on special temporary duty they receive actual expenses not exceeding \$5 per day.	Pharmacists receive one cooked ration at hospital stations, but do not receive such rations at contract stations such as Norfolk, Va., Buffalo, N. Y., Galveston, Tex., Philadelphia, Pa., Pittsburg, Pa., etc., etc.
A cooked ration may be drawn by single officers and the service reimbursed at the current rate or cost for the month, about 29 cts. per day, or less.	Married stewards are allowed one uncooked ration at hospitals, which will be given in detail thereafter.

LAUNDRY.

Medical officers do not receive laundry work at hospital stations, but do on vessels and camps and on special duty.	Pharmacists are entitled to plain laundrying for themselves (not their families) at hospitals, but do not receive it at contract stations.
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ADDITIONAL.

Medical officers are permitted to practice medicine and receive compensation therefor at all stations.	No allowances of this sort.
A "station wagon," properly a carriage or surrey, with station horses is provided for the use of the medical officer in command.	

LEAVE.

Cumulative leave allowed by legislation to medical officers; that is, four months leave can be taken at one time, providing no previous leave has been granted for three years.	Not to exceed thirty days. Leave can be granted if approved by the medical officer in command.
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The three bills which have been introduced by our friends and are now before Congress in the interest of the Marine Hospital Stewards are as follows:

[H. R. 12501.]

57th Congress, 1st Session. Introduced by Mr. Livingston, March 13, 1902.

A BILL

TO REORGANIZE AND INCREASE THE EFFICIENCY OF THE MARINE HOSPITAL SERVICE, AND FOR OTHER PURPOSES:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the President is hereby authorized and directed to appoint and commission the pharmacists of the United States Marine Hospital Service, now serving in that capacity, as "Pharmacists, United States Marine Hospital Service," at an annual compensation of one thousand two hundred dollars, with ten per centum increase for each five years of service, up to and not exceeding thirty per centum and present allowances.

SEC. 2.—That vacancies in the grade of pharmacists shall be filled from the list of pharmacists of the United States Marine Hospital Service after three years of satisfactory service in that capacity, after due examination by a board comprised equally of medical officers and pharmacists of said Service, to be appointed and convened by the Supervising Surgeon-General of the United States Marine Hospital Service; and after the passage of this Act the pharmacists of the Marine Hospital Service shall be entitled to the benefits and privileges of all Acts and regulations which are now in force or may hereafter be enacted or established for the commissioned officers of the Marine Hospital Service.

SEC. 3.—That all Acts or parts of Acts inconsistent with the provisions of this Act be, and the same are repealed.

[S. 4583.]

57th Congress, 1st Session. Introduced by Mr. Bacon, March 19, 1902.

A BILL

TO REORGANIZE AND INCREASE THE EFFICIENCY OF THE MARINE HOSPITAL SERVICE, AND FOR OTHER PURPOSES.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled, That the President is hereby authorized to appoint and commission the pharmacists of the United States Marine Hospital Service, now serving in that capacity as "Pharmacists, United States Marine Hospital Service," at an annual compensation of one thousand two hundred dollars, with ten per centum increase for each five years of service, up to and not exceeding thirty per centum and present allowances.

SEC. 2.—That vacancies in the grade of pharmacists shall be filled from the list of pharmacists of the United States Marine Hospital Service after three years of satisfactory service in that capacity, after due examination by a board comprised equally of medical officers and pharmacists of said Service, to be appointed and convened by the Supervising Surgeon-General of the United States Marine Hospital Service, and after the passage of this Act, the pharmacists of the Marine Hospital Service shall be entitled to the benefits and privileges of all acts and regulations which are now in force, or may hereafter be enacted or established for the commissioned officers of the Marine Hospital Service.

SEC. 3.—That all Acts or parts of Acts inconsistent with the provisions of this Act be, and the same are, repealed.

[H. R. 15349.]

57th Congress, 1st Session. Introduced by Mr. Henry C. Smith, July 1, 1902.

A BILL.

TO INCREASE THE EFFICIENCY OF THE UNITED STATES MARINE HOSPITAL SERVICE:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That on and after the passage of this Act the pharmacists of the Marine Hospital Service shall be entitled to receive compensation and allowances, namely: All senior pharmacists the sum of one thousand two hundred dollars per annum, and all junior pharmacists the sum of one thousand dollars per annum, and said pharmacists shall receive the allowances provided by existing regulations; Provided, That all pharmacists shall hereafter receive, after five years' service, an additional compensation of ten per centum per annum, but in no case shall the maximum exceed forty per centum: And provided further, That the Secretary of the Treasury, upon the recommendation of the Surgeon-General of the Public Health and Marine Hospital Service, may continue, for special reasons to be stated, the present compensation of such pharmacists as now receive by regulation over one thousand two hundred dollars per annum.

We have endeavored to give a clear statement of our work during the past year. Much work has been done which has been touched upon in this report only very slightly. To our worthy President, H. M. Whelpley, we wish to extend our warmest thanks for the very hearty, earnest and enthusiastic manner in which he has worked and co-operated with our committee.

To A. E. Ebert, of the Committee on National Legislation, and to William Mittelbach, Treasurer of the Missouri Pharmaceutical Association, we also wish to express our high appreciation for the thought, work, and other valuable aid which they gave our committee.

The following contributions were given during the year to aid our work:

Missouri Pharmaceutical Association	\$25 00
Meyer Bros., St. Louis	25 00
Mallinckrodt Chemical Works, St. Louis	25 00
Sultan Drug Co., St. Louis	25 00
Smith, Kline & French Co., Philadelphia	25 00
Rosengarten Sons, Philadelphia.....	25 00
Miscellaneous, 10 cents to \$1.00.....	9 10

Where all have done so well, we do not feel that any one will object to this special recognition of those who have done so very much to help us during the present year.

On September the fifth of last week we called upon Surgeon-General Walter Wyman at his offices in Washington. He personally assured us that in the forth-coming regulations soon to be issued he would so fully meet the wishes of the American Pharmaceutical Association that we would be well pleased and satisfied. He also promised to detail two pharmacists to represent the Public Health and Marine Hospital Service at the present meeting of the American Pharmaceutical Association. These delegates will be with us and will represent the first official recognition of this kind by our Government of American Pharmacy as a profession.

We look forward to considerable recognition along proper lines in the early future.

Respectfully submitted,

GEORGE F. PAYNE, *Chairman*.

The report was heartily applauded.

Mr. Mayo moved to accept the report, with the thanks of the Association for the excellent work done, which motion was seconded by Mr. Hancock and carried.

THE PRESIDENT: I have just learned that the Pennsylvania State Medical Society will hold a meeting commencing to-morrow, and that two of our fellow-members, Mr. William McIntyre and Mr. A. Hoch will be in attendance. If it meets with the approval of the Association, the President would like to appoint these two gentlemen to represent the Association and convey the greetings of the American Pharmaceutical Association to the State Medical Society.

Mr. Hancock, seconded by Mr. Lowe, made the motion, and it carried unanimously.

MR. WILBERT: If it is in order, Mr. President, I would like to present at this time two resolutions that were passed in the Section on Education and Legislation this morning, and ordered to be sent here for final action.

Mr. Wilbert then read the following :

To further endorse the repeated action of the American Pharmaceutical Association, in connection with the adoption and use of the Metric System of weights and measures in the U. S. P.

Resolved, That the "Section on Education and Legislation" recommend that the Association request that whenever and wherever practicable, the pharmaceutical journals use the Metric System of weights and measures in all original papers, formulas, doses, and the results of scientific investigation.

THE PRESIDENT: You have heard the reading of the first resolution, referred to this session for final action. What will you do with it?

Mr. Anderson moved its adoption, and the motion was seconded by Mr. Mayo and carried.

Mr. Wilbert then read the second resolution.

To facilitate the transaction of section work, and promote the distribution of full and reliable reports of the papers presented before the Sections of this Association be it

Resolved, That the Section on Education and Legislation recommend that the Association take favorable action on the first suggestion contained in the chairman's address;

that in future all writers of papers be required to present a written abstract or a *résumé* of the essential points contained in their respective communications; such abstracts to be used for the consideration of the executive officers of the Section to which it is to be referred, and for subsequent distribution among members of the pharmaceutical press.

THE PRESIDENT: You have heard the reading of the second resolution, which calls for the expenditure of a small sum annually.

THE SECRETARY: I would like to ask for information, whether it is intended that, in addition to printing the whole paper, the Association shall print the abstracts also.

MR. WILBERT: No, sir; these abstracts are to be printed and sent to the officers of the Sections. There was one paper read here this morning which the Secretary of the Section did not get. If the members presented written abstracts of the essential points of their papers, the officers of the different Sections could have an exact idea of the contents of the paper, and whether or not it applied to the particular Section; and a *résumé* would be subsequently printed in the journals, so that the public would have an idea of the contents, and the paper would not be lost, so to speak, as it is now for several months after the meeting adjourns.

The question upon the adoption of the resolution was put to a vote and carried.

Vice-President Payne was called to the chair.

THE SECRETARY: Two amendments to the By-Laws were offered the other day, to be laid over for action until this session. One was to amend Chapter 8, Article VI, by striking out the word "session" in the article, and inserting in lieu thereof the words "and fifth sessions," so that the article as amended will read, "The fourth and fifth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing." The object, as before stated, is to give two sessions to the Section on Practical Pharmacy and Dispensing, instead of one, as heretofore.

The question was put upon the amendment, and it was adopted.

THE SECRETARY: The second amendment proposed is to strike out the word "fifth" in the seventh article, so that it will read, "The sixth and seventh sessions shall be devoted to the reading of scientific papers and the discussions thereof." This amendment is made necessary by the one just adopted, to make the articles consistent, and equalizes the Sections in the number of sessions allotted them.

This amendment was also adopted without dissent.

THE SECRETARY: I desire to present a communication from Washington, which, unfortunately, is a little late, as the Government Departments close at 4 o'clock, I believe, and that was the limit of time for making application. But I do not suppose any of the members present would have taken advantage of the information. It is no more than proper that I should present it, however. It is a letter from the United States Department of Agriculture—a letter from the Acting Chief, Mr. Bigelow:

DEPARTMENT OF AGRICULTURE, BUREAU OF CHEMISTRY, {
OFFICE OF THE CHIEF, August 26, 1902. }

AMERICAN PHARMACEUTICAL ASSOCIATION, PHILADELPHIA, PA.:

Dear Sir: You are doubtless aware that the Bureau of Chemistry is about to establish a drug laboratory for the purpose of carrying on the work of the investigation of drugs that is authorized by our appropriation.

I am enclosing herewith a copy of the circular issued by the United States Civil Service Commission,

or the purpose of inviting applicants who desire their names added to the list of eligibles for the appointment of Chief of the drug laboratory.

We desire the best man available for this position, and shall appreciate it if you will give the circular as much publicity as possible.

Respectfully,

W. D. BIGELOW, *Acting Chief.*

Accompanying this letter is a printed circular giving the details of the Civil Service examination for the position of Chief of the Drug Laboratory, and showing that the applicant must be over twenty years of age and that the salary attached to the position is \$2,000 per annum.

"No one will be examined who is not a graduate in pharmacy or pharmaceutical chemistry (or an equivalent), and who has not since graduation had training and experience in the investigation of the purity and strength of substances used as therapeutic agents, and in the various sciences, a knowledge of which is essential to the successful conduct of such investigations."

This shows, as was brought out at the Scientific Section meeting the other night, that the Government is lending a hand in this desirable movement of establishing a pharmaceutical laboratory, and that graduates in pharmacy are eligible for the position of chief.

THE CHAIR: Gentlemen, the paper is with you. Will you submit it to publication or not?

Mr. Mayo moved to refer to the Publication Committee, with authority to publish or not, in their discretion. The motion was seconded by Mr. Gable and carried.

THE SECRETARY: I have here two communications that come to us from the Section on Scientific Papers, and one of them involves the adoption of a resolution proposed by the Committee on Drug Adulteration, Mr. E. L. Patch, Chairman:

"*Resolved*, That in the judgment of the American Pharmaceutical Association the appraising and inspection of drugs at our different ports should be placed under the supervision of the Drug Laboratory, so securing uniformity not now existing."

The detail of it is as follows:

"Your Committee consider the establishment of the Drug Laboratory at Washington to be one of the most important events that have transpired in the history of American Pharmacy, and we recommend to the General Session the consideration of the following resolutions, in addition to that previously offered:

WHEREAS, We have learned that, under authority of an Act of Congress, the Secretary of Agriculture has established a laboratory in the Bureau of Chemistry, to study the composition and adulteration of drugs; therefore,

Resolved, 1st.—That the American Pharmaceutical Association offers to the Secretary of Agriculture its most cordial collaboration in this work, which promises so much benefit to the manufacturers of and dealers in drugs, as well as to the consumers thereof.

2d.—That this Association will use its influence with the Congress of the United States to secure any reasonable appropriation to properly carry on this work in a systematic and effective manner.

3d.—That the President and Secretary of the Association be authorized to convey to the Secretary of Agriculture a minute of these proceedings, and to represent the Association before the Committee on Agriculture of the House and the Committee on Agriculture and Forestry of the Senate, when the next agricultural appropriation bill is under consideration."

Mr. England, seconded by Mr. Anderson, moved the adoption of the resolutions as read, and the motion prevailed.

THE SECRETARY: Here is another communication from the Scientific Section, embodying a resolution, and, I presume, asking the adoption thereof by the general Association:

"WHEREAS, The accurate measuring-out and administration of doses of liquid medicines is a matter of great scientific as well as practical importance; therefore, be it

Resolved, That the Scientific Section of the American Pharmaceutical Association recommend that the Association in general meeting endorse the set of resolutions adopted at a pharmaceutical meeting held at the Philadelphia College of Pharmacy, Tuesday, April 15, 1902:

Whereas, It is desirable to secure greater accuracy and more uniformity in the measuring out or administration of doses of liquid medicines.

Therefore, be it Resolved, That we, members of the Philadelphia College of Pharmacy, assembled at this pharmaceutical meeting, recommend the use of accurately graduated glass dose measures; these measures to be constructed so that the height of the contained liquid, at a spoonful mark, is greater than its diameter.

Resolved, That for use in connection with spoons as dose measures, we recommend the promulgation of the following definition taken from the French Codex:

"A spoon is full when the liquid it contains comes up to, but does not show a curve above, the upper edge or rim of the bowl."

Resolved, That for use in connection with the metric system of weights and measures, we recommend the adoption of the following approximate equivalents of spoonfuls: 1 teaspoonful equals 5 c.c.; 1 dessert-spoonful equals 2 teaspoonfuls, or 10 c.c.; 1 tablespoonful equals 3 teaspoonfuls, or 15 c.c."

These resolutions I have just read were sent over from the Scientific Section, and the Section asks that the Association endorse these resolutions regarding the definition of the word "spoonful," and also the equivalent of the different spoonfuls in the Metric System.

Mr. Wilbert, seconded by Mr. Boring, moved the adoption of the resolutions as read, and it was so ordered.

THE SECRETARY: I have another proposition here to amend the By-laws, which I have just received and which may come too late, but I will read it anyhow, at the request of the mover. Possibly, we might adjourn for a short time and then adopt it, but it is hardly worth while to do that. It is in regard to the Ebert Prize, and proposes to make a change in Article V, Chapter IX:

CHANGE IN BY-LAWS.

CHAPTER IX.

Article V changed should read as follows: The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the one at which the essays are presented, report which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

L. F. KEBLER.

THE PRESIDENT: Gentlemen, you will take due notice of the proposed change in the By-laws. Action will be taken at the proper time.

THE SECRETARY: Mr. President, the Committee on President's Address has not yet completed its report.

THE PRESIDENT: I understand Mr. Sheppard will be here in a few minutes.

A report from the delegation to the National Association of Retail Druggists was called for, but none of the committee was present.

The report of the Committee on Procter Memorial was called for, but the committee was still out, and the President asked if there was any general business to be presented by any one, as this was an opportune time to consider it, whilst waiting for the Memorial Committee, which would be in in a few minutes.

THE SECRETARY: Mr. President, I move we take a recess for three minutes, to re-convene at the call of the President.

It was so ordered, and the convention took a short recess.

When the Association was again called to order, the Secretary presented the amendment to Article V, Chapter IX of the By-laws, read before the recess.

THE PRESIDENT: You have heard the proposition to change the By-laws. What is your action in the matter? A motion to adopt is in order.

Mr. Caspari, seconded by Mr. Sheppard, so moved, and it was so ordered.

The report of the Committee on Procter Memorial was then called for, and Mr. Remington, chairman, presented the report as follows:

REPORT OF COMMITTEE ON PROCTER MEMORIAL.

The Special Committee appointed by President Whelpley to present a report upon a suitable means of honoring the memory of Prof. William Procter, have carefully considered the many propositions which have been made during the last three years. Many of the methods suggested by writers upon this subject were found to be impracticable; and some impossible of successful execution. One very serious objection to the plan of establishing a research laboratory, either in Washington, Philadelphia or elsewhere, was the difficulty of successfully maintaining it in perpetuity. It would not be a difficult task to raise sufficient money to start a research laboratory, but it would be an exceedingly difficult thing to provide an endowment fund which would maintain such a laboratory successfully forever. It would be no honor to the memory of Prof. Procter for us to raise a considerable sum of money and start a laboratory only to have the interest in it wane and fade in the future, and then die out. Laboratories for research purposes have been established in many parts of the world, particularly by large business firms, and these have been successful; they have good reason for the success from the fact that abundant resources are at hand, and a concentrated interest due to competition is always present. Our late chairman of Council, William S. Thompson, believed that it would be necessary for the committee to raise \$300,000 in order to successfully maintain a research laboratory.

Another plan which was advocated by a number, that of erecting a statue to be placed in the rotunda of the Capitol at Washington, met with the opposition of the remaining members of Prof. Procter's family, and also from those friends who are still living, and who knew Prof. Procter intimately, on the ground that such a display would be utterly repugnant to the views, and inconsistent with the character of one who disliked display.

The creation of a scholarship or traveling scholarship to educate a student abroad in some line of original research, did not appear to the committee to be exactly consistent with the life-work of the Father of American Pharmacy. His work was, more than anything else, the upbuilding of American pharmacy, and whilst it is true that science

knows no language and no country, it was not felt that this plan would be as feasible or appropriate as the one which your committee have the honor of recommending.

Your Committee believe that we have right at our hands, a means of honoring the memory of Prof. Procter and perpetuating it as long as this Association continues to exist. It will be remembered that this Association created a fund in 1856, which was later termed the Life Membership Fund. In fact, various sums of money have been added to this fund from time to time, and it has been gradually growing, until at the last report, ending July 1, 1902, it amounts to \$12,617.01. It is not strictly entitled to the name of the Life Membership Fund, because it has received accretions from the general resources of the Association from time to time, and has been most carefully husbanded by the exertions of our most efficient Treasurer, until it constitutes the largest single fund in our resources. The provision has always existed in the past, that under no consideration shall the principal be diverted for any purpose, but that the interest alone shall be available or used, and it is not intended now to change the well-established usage, but we can permanently perpetuate the name of the distinguished and beloved Procter by giving to this substantial fund his name, and it is therefore recommended that this fund be known hereafter as "The William Procter Fund."

Prof. Procter's most intimate friend and co-worker in the early days of this Association, was Dr. Edward Robinson Squibb. Dr. Squibb steadfastly declined every honor that this Association sought to bestow upon him, yet he and Prof. Procter were always found together advocating every good movement which would tend to elevate pharmacy and advance the interests of this Association. Your Committee believe that the time has now come for this body to found a Procter-Squibb gold medal, and the credit of this suggestion belongs to one who is very near to us at this moment, who is now speeding homeward on an ocean steamer, sad at heart and bitterly disappointed because of failing health which prevented him from being with us to-day to join in the celebration of our Golden Jubilee—Dr. Frederick Hoffmann, of Berlin.

He it was who advocated most warmly the founding of the Procter-Squibb gold medal, and the appropriateness of this additional method of honoring the name of Procter has appealed to your Committee with much force, and we respectfully recommend:

That a special committee, consisting of five members, to be annually elected by the Council, with the power to fill vacancies vested in the Council, shall be created, whose duty it shall be to award, at periods not oftener than three years apart, the Procter-Squibb medal to one who has contributed distinguished services to pharmacy, chemistry or materia medica, under such regulations as shall hereafter be approved by the Council. The special committee are not to be restricted in their choice to American citizens, but to be left free to award the medal to those most deserving of this high honor, wherever they may reside.

Your Committee further recommend that a special button badge be made, which shall have upon its face in bas-relief the bust of Prof. Procter, to be called the Procter Badge, this badge to be sold by the General Secretary to members who will wear it hereafter at our meetings, the price to be inexpensive, and the proceeds of the sale to be added to a fund to be devoted to perpetuating the memory of Prof. Procter; a special committee to be appointed by the President to have such button badge made, and after approval by the Council, the whole to be placed in the hands of the General Secretary for proper distribution under the adopted rules.

Respectfully submitted,

ALBERT E. EBERT,
C. LEWIS DIEHL,
S. A. D. SHEPPARD,
JOSEPH P. REMINGTON, *Chairman.*

The report was received with applause.

THE PRESIDENT: You have heard the reading of this interesting as well as important report, gentlemen. What action will you take in regard to it?

MR. SHEPPARD: I would state that the figures given in the report as the amount of the Life Membership Fund are those of the face value of our government bonds. The market value at present is not far from \$14,000. I move that this report be received, and its recommendations be adopted, and that the William Procter Fund so established remain intact until the principal shall reach the sum of \$25,000.

Mr. Kremers seconded the motion.

MR. EBERT: I wish the Treasurer had not set that limit of \$25,000.

MR. SHEPPARD: That is not a limit. It is a minimum, not a maximum.

MR. EBERT: Would it not be better to have the committee take that matter in charge—to leave the matter of a maximum and minimum to be reported on at our next annual meeting?

MR. SHEPPARD: Mr. President, we have been thinking this matter over for a good many years now, and I think the Association is just as well qualified to decide the question to-night as it will be next year. I think we do not want to have any more committee reports on this subject—that we want to decide yes or no right now.

THE SECRETARY: It strikes me that if the suggestion of the committee be adopted, and particularly the motion by Mr. Sheppard following it, it will necessitate an amendment to the Constitution. I do not know whether the Treasurer has read the provision on this subject or not:

“Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States government or state securities, the interest of which for any current year only may be used by the Association for its expenses.”

MR. SHEPPARD: That forbids us to use the principal only, not the interest.

MR. GOOD: Let us pass on the adoption of the report first, and then we can consider the matter of details.

MR. SHEPPARD: I rather expected this, and by permission I will withdraw the latter part of my motion and present the first part only, that the report of the Committee be received and the recommendations adopted.

MR. HANCOCK: Mr. President, I have listened with a great deal of interest to the report of the Committee, but I do not feel that this is the right way to deal with Prof. Procter's memory. Some two or three years ago, I was present in Washington at the unveiling of a statue to the memory of the eminent surgeon, Dr. Gross, of this city. The medical profession unveiled that statue, and it was conducted with a great deal of *eclat*—they had a large assembly there. It occurred to me at that time that we had a man who had labored more for the advancement of ethical and practical pharmacy than any other man who has ever been engaged in that work—whose life-work was completely dedicated to the service; and it occurred to me that he ought to be recognized by his profession, as Dr. Gross had been by his. This Association owes its organization more to Prof. Procter than to any man who was in the convention when the first meeting was held in New York, and he did more to prepare the meeting for the next year in Philadelphia than any one else, while at that meeting in Philadelphia he did more to promote the organization of the American Pharmaceutical Association than any other person present.

From its organization, he was a faithful and worthy member, diligently serving the interests of pharmacy and dedicating his entire life to that service. The time has now come when we ought to have pharmacy recognized as William Procter established it, and we should recognize him as the Father of American pharmacy. We should erect in the capital of the country a monument dedicated to American pharmacy, and we should establish William Procter as the Father of American pharmacy. That would be an enduring monument, not likely to decay, as this Association may, and not to be lost, as a medal may.

Another thing I object to—although I honor the memory of Dr. Squibb as much as anybody—is the proposed association of those two names in the form of a medal. Mr. Procter stands alone and above every man, as the exponent of pharmacy in the United States, and he has done more to advance the interests of dispensing pharmacy than any other man; and, although these two men were as brothers working together—as it were, welded together in their great work—yet they were entirely different, and I do not think this medal should be in remembrance of both. I believe we should recognize William Procter alone as the greatest man this country has produced in the field of pharmacy, and the one who has done the most to advance the interests of the dispensing pharmacist. Dr. Squibb had a private interest—he was a manufacturing chemist; but of course he came to our meetings and the meetings of the American Medical Association. Prof. Parrish, who was also associated with Prof. Procter when the Association was organized, and was a faithful worker, was also engaged in private work; he had a private school. But William Procter worked in his shop; he stood behind the counter, without considering any of the emoluments that might come to him by reason of his pharmaceutical knowledge. And William Procter having dedicated his life to the work, as he did, and having attained to this distinguished honor above every other man, his name should not be associated with that of any other man, I care not how worthy he was. I believe we should defer action in this matter, and see if the Association cannot, after due reflection, conclude that the time has come to honor American pharmacy by the erection of a monument at the capital, with this man's memory to crown it. [Applause.]

THE PRESIDENT: I am certain that we all appreciate the glowing tribute to the memory of Prof. Procter which has been paid by ex-President Hancock, of the year 1873.

MR. HANCOCK (continuing): I might add that I have talked over this subject with some of my friends, and I have had a number of persons to approve of this suggestion, and some of them have said they were willing to subscribe to the fund if it is decided upon. Now, my idea has been that this Association should be the one to first start the effort to secure the subscription necessary for the erection of this monument. Mr. Procter did more to bring about the organization of the American Pharmaceutical Association than any other single man, as I have said before. This Association is the mother of the pharmaceutical associations of this country. She is the foster-mother of the State associations, and William Procter stands above all as the Father of American pharmacy. If this Association will properly formulate a plan with which to approach the manufacturing chemists, with which to go to the pharmacists and physicians of the country, and then have it carried into the State associations and advocated, I am sure there will be very little trouble in obtaining by contribution a very handsome fund for this purpose. The burden would be borne more largely by the manufacturers, but we want the pharmacists of the country to contribute, if it is only a small amount, so as to show their interest in this work, and so that every man will feel that he has contributed his mite to the erection of this monument, that is to honor not only Prof. Procter, but the advances that have been made in pharmacy in America.

MR. REMINGTON: I feel very certain that our friend Mr. Hancock would be willing

to vote for the adoption of this report, and then let us vote on the additional proposition to appoint a committee to consider the erection of a statue such as has been suggested by the gentleman. I am sure he would have no objection to doing this. We can do both of these things if we wish. Let us go ahead and adopt the report first, and then if the gentleman wishes, and the Association approves, we can appoint a committee to consider the proposition of erecting a statue.

MR. HANCOCK: I am not at all opposed to the report.

MR. REMINGTON: But it is not going as far as you want.

MR. HANCOCK: That is it. I think we should do more.

THE SECRETARY: I approve of the action of the Committee, and I shall vote for it; but I am afraid we are getting in a tangle in this matter. The Life Membership Fund is subject to the Constitutional provision, and to make this change would require special action, in order to make it legal.

MR. REMINGTON: That does not interfere at all. The Committee had to make a beginning with this Procter Memorial. Whatever changes in the Constitution or By-Laws may be necessary can be made later. We have had this matter before us for three years now, and it is time we were doing something. At the next meeting such amendments can be made as may be necessary to conform to this report. Also, I may say, the adoption of the report need not interfere in any way with the formation of a committee to consider the erection of a statue, as I have said before. That matter can also come up at the next meeting.

MR. SHEPPARD: In answer to the Secretary, in regard to the Constitution and By-Laws, I will say that there is no change required in either in order to do this. I think the only change necessary to be made would be in our general rules of finance, where provision is made for the use of the interest on the Life Membership Fund, and that can be done by an ordinary majority vote of the Association.

THE PRESIDENT: The Chair feels that the report is perfectly in order, and that any change in the Constitution and By-Laws would be a matter for subsequent consideration.

The motion to adopt the report was then put to a vote and carried.

MR. SHEPPARD: I now renew the latter part of my motion in another form, that a committee of three be appointed by the chair to consider the question of allowing the William Procter Fund to remain intact until the principal amounts to at least \$25,000. I notice there is but a small number present, and I would not take snap judgment in this matter, so I move the appointment of this committee, which shall report next year.

The motion had a second in Mr. Good, and was adopted without further discussion.

The additional report of the Committee on President's Address was called for, and Vice-President Payne was asked to take the chair pending action on it.

Mr. Sheppard, first reminding the assembly that the Committee had made a partial report at a previous session, at which time they asked for time to make an additional and final report at this session, then read the report:

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS.

ADDITIONAL AND FINAL REPORT.

We beg leave to report on the report of the Committee on General Prizes referred to us, and the President's recommendations on the same subject referred back, as follows:

We recommend that the plan of awarding the general prizes be changed in such manner that the Hermann Hager Prize and the John M. Maisch Prize be the same in amount as at present, and awarded by a special committee to be appointed by the President; that the total amount now given in General Prizes (\$100) be distributed, if worthy papers are presented, in prizes of \$25 each by the officers of the four Sections, and that the General Secretary be instructed to change the phraseology of the rules as to prizes as found on pages xxiii and xxiv of the 1901 proceedings, in such manner as to fit them to the proposed plan.

We further recommend the adoption in full of the President's suggestions, Nos. 1, 6 and 7, in regard to written abstracts of papers, improvement of apprentices and continuation of the committee on status of pharmacists in government employ, and that a special committee of three be appointed by the President to present the views of the Association as to the most desirable character and scope of the work of the drug laboratory of the United States Department of Agriculture. Suggestion No. 13, relating to a semi-centennial index, we think should be referred to the Council.

S. A. D. SHEPPARD,
ALBERT E. EBERT,
J. N. HURTY,
Committee.

(For partial report first submitted see page —.)

THE CHAIR: Gentlemen, the recommendations and suggestions of the Committee on President's Address are with you. What shall we do with them?

Mr. Mayo, seconded by Mr. Anderson, moved to adopt *in toto*.

MR. KREMERS: Mr. President and Gentlemen of the Association, as a member of your Committee on General Prizes for last year, I want to make a few remarks in this connection. I should like to call your attention to the fact that the report of the Committee on President's Address altogether defeats the objects that the Committee had in view in making these recommendations to the general session. I hope you will defer action on this part of the Committee's report, and refer it for action to the Council, to be reported on next year. Some of the main difficulties we had to contend with are not noticed at all, while other matters are still further complicated.

MR. SHEPPARD: I second Mr. Kremers' motion. I think it is probably wise to have a fuller discussion of the matter.

MR. KREMERS: I move that the first part of the Committee's report be referred to the Council, to report next year to the Association.

Mr. Kremers' motion was put and carried.

THE CHAIR: Now the motion of Mr. Mayo, subject to this amendment, is before you.

The question was put, and the motion as amended by Mr. Kremers motion was carried.

Mr. Sheppard offered the following:

Moved, that the Local Secretary be made chairman of the Committee on Arrangements for the 1903 meeting, and be instructed to appoint three additional members to serve with H. M. Whelpley and the local secretary as a Committee of Arrangement.

Mr. Caspari seconded the motion and it was adopted.

President Whelpley resumed the chair.

The President asked if any member had any business to bring before the Association before the installation of officers took place, whereupon the Secretary presented the following communications and reports from delegates to state associations :

BLUE MOUNTAIN, MD., *June 26, 1902.*

To the President, Council and Members of the American Pharmaceutical Association :

The Maryland Pharmaceutical Association, in annual convention assembled, sends heartiest greetings to you, representatives of the greatest promoter and conservator of pharmaceutical knowledge—The American Pharmaceutical Association—and cordially congratulates it upon the accomplishment of fifty years of active and useful living; upon the powerful influence it wields and the substantial help it has always given to true pharmaceutical effort.

The Maryland Association notes with pleasure that so great a body as you represent makes no distinction in the recognition given to the several branches of the pharmaceutical whole, but welcomes and encourages alike retailer and jobber, dispenser and manufacturer, scientist and salesman, and in this most admirable and catholic policy, blesses all and by all is as fondly blessed.

Believing a confederation of the several accredited state associations very desirable and feeling assured that representation, by delegates, in such a body as your own, would greatly develop and enlarge the powers of these local societies, this Association humbly but earnestly petitions your honorable selves to so alter and amend your Constitution and By-Laws as will give delegates from State Associations more conspicuous and potent influence in the several Sections of the American Pharmaceutical Association, whereby its honorable career may be continued and its influence and usefulness greatly extended, as is so fondly hoped by all.

Respectfully submitted,

LOUIS SCHULZE, *President.*

OWEN C. SMITH, *Secretary.*

To the President and Members of the American Pharmaceutical Association :

Your representative delegate appointed to represent this body at the twenty-fifth annual meeting of the Pennsylvania Pharmaceutical Association, having performed the pleasant task assigned him, respectfully submits the following report :

The meeting was called to order by President W. L. Cliffe, 8 p. m., Tuesday, June 24th, in the ball room of the Buena Vista Hotel, Franklin Co., Pa., located on top of the Blue Ridge Mountains, adjoining the Maryland state line.

Your representative was most cordially received and was given the privileges of the floor, which he duly embraced to advocate the claims of this Association to the favorable consideration of those not already members of the American Pharmaceutical Association.

This silver anniversary meeting of the Pennsylvania Association was notable for two pleasing events, namely : social intercourse and joint business sessions with the Maryland Pharmaceutical Association, who were in convention at the Blue Mountain House in close proximity.

The other pleasing feature was the presentation of a silver tea service to Dr. Jacob A. Miller, as Secretary, and Mr. Joseph L. Lemberger, as Treasurer, who so faithfully and worthily filled their respective offices from the beginning of the Association.

The usual attendance, contribution of papers, and same degree of interest was manifested at all the sessions.

The convention continued in session four days and adjourned to meet at Eagle's Mere, June, 1903.

JOHN F. PATTON.

Sept. 6, 1902.

DR. H. M. WHELPLEY, *President American Pharmaceutical Association.*

Dear Sir: The twenty-third annual meeting of the Iowa Pharmaceutical Association convened in Sioux City, July 8, 1902, with perhaps the largest concurrent attendance of any meeting in a dozen years. For this the State Association is indebted to the vigorous efforts of the local committee, who are known not to do things by halves.

Notwithstanding the fact that the average Iowa member goes to his State meeting to renew acquaintances, make friends, rest from his labors and enjoy himself, there are annually presented at the meetings a number of papers on scientific and trade interest. Unfortunately the hours of the sessions are so filled with routine work that little time is left for the reading and discussion of these papers.

Pursuant to your request it was my pleasure to extend to the Iowa Pharmaceutical Association on your behalf the fraternal greetings of the mother society, and to bring to the notice of the members the claims of the American Pharmaceutical Association for moral and material support, and the advantages to be derived by membership.

Mr. Gust. Scherling, of the local committee, had anticipated my feeble efforts with much good work, and as a result a number of applications for membership are presented at this meeting from Iowa.

I am confident that pharmacists everywhere realize their obligations to the American Pharmaceutical Association, and only need to have the obligations and benefits brought to their notice to respond promptly. I now regret that the opportunities have been so long delayed in our State.

Respectfully submitted,

EMIL L. BOERNER,

Sept. 9, 1902.

Delegate to Iowa Pharmaceutical Association.

To the President and Members of the American Pharmaceutical Association:

As a delegate from this Association, appointed by our President, I had the pleasure of attending the thirty-second annual meeting of the New Jersey Pharmaceutical Association. The meeting was held at Atlantic City, in the Hotel Isleworth, June 4th and 5th, 1902.

The meeting was called to order by the President, James Foulke, in the parlor of the hotel; there was quite a good attendance and the President's very able address was listened to with a great deal of attention. He made a number of recommendations in the interests of the Association and Pharmacy; one that was an advance step, being a raising of the requirements for registration in the state. All applicants for registration must be graduates of a college of pharmacy before they are eligible to make application for registration before the Board of Pharmacy. He called attention to the fact that all veterinary surgeons must be graduates from some college and file a copy of their diplomas. How much more important should it be that those, whose duty it was to dispense medicines for both man and beast, should be fully qualified for their duties.

The Secretary reported a total membership of three hundred and ninety-eight (398), a gain of fifteen (15) over last year's report. Thirty-six new members joined at the meeting, making a total membership of four hundred and thirty-four (434).

The report from the Board of Pharmacy was very interesting and very favorably received. The Board has been testing its new pharmacy law, and has secured convictions and collected fines in every case they have tried.

One case carrying an appeal to the Supreme Court of the state on the constitutionality of the law and other points, the Courts sustained the law in every instance.

The Secretary reported 285 applicants examined, and eighty-eight passed, for the year; also a registration of the pharmacists of the state, 1,731 being the number in good standing at the present time in the state.

A very generous offer was made to the Association by the New Jersey College of Pharmacy through its President, offering a free scholarship to the Association, to be known as the Free Scholarship of the New Jersey Pharmaceutical Association, open to any young man in the State by competitive examination, the members of the board to be selected by the President of the Association, the examinations to be yearly, the college to accept their decision in the contest. It was accepted by the Association with many complimentary remarks.

Resolutions were adopted in reference to the loss sustained by the Association and Pharmacy by the death of Dr. Charles Rice; motion being made that a suitably engrossed copy be prepared and sent to the New York College of Pharmacy, attested with the signatures of the officers of the Association. A number of very interesting papers were presented by the Query Committee; but, owing to the limited time, only two were read, the others appearing in the proceedings of the Association.

The meeting of our Association in Philadelphia was brought before the members by your delegate, and was very ably assisted by the members of our Association who were present. Our meeting being held so near New Jersey, gave it more interest, and many promised to attend our semi-centennial meeting and enjoy our hospitality. I secured 12 members who will join at this meeting.

The entertainment, given by the Pharmacists of Atlantic City, was thoroughly enjoyed by all. Many took the opportunity to make a friendly call on Prof. Remington at his house, and were shown the great amount of work being done there on the Revision of the Pharmacopoeia, which was very interesting and instructive.

The next meeting of the Association will be held at Lake Hopatcong, N. J., in 1903.
Sept. 3, 1902.

GEO. W. PARISEN.

MR. HENRY M. WHELPLEY, *President, A. Ph. A., Philadelphia, Pa.:*

Dear Sir: Having been appointed to represent the A. Ph. A. at the Washington State Association, I have the honor to submit herewith report of the meeting of the Association:

The Association met in the city of Seattle, July 12th, and the attendance was a good representation of the entire State and was one of unusual interest. The most important matters acted upon were:

The proposed formation of the Pacific Coast Association of druggists' local organizations for the purpose of effectively battling with the cut-rate evil and in other ways co-operating to promote the commercial welfare of the trade; the endorsement of the good work of the National Association of Retail Druggists; the endorsement of the Joy bill now pending in Congress, and proposing the reduction of the tax on alcohol used in the liberal arts to 70 cents per gallon; the endorsement of five druggists from whom the Governor may appoint a member of the State Board of Pharmacy, to succeed J. W. McArthur; the admission of new members; the election of officers for the ensuing year and appointment of committees to care for the work of the organization; the awarding of prizes for the most meritorious papers, and the passing of resolutions of condolence to the relatives and friends of deceased members.

The following resolutions were adopted:

Resolved, That the State Medical Association be invited to name a delegate each year to represent their association in the annual meeting of the Washington State Pharmaceutical Association.

Resolved, That this association elect a delegate to the State Medical Association to convey to that body our fraternal and cordial good wishes, and to report back to this association all matters of mutual interest.

The following gentlemen were elected as delegates to represent the association at the A. Ph. A.: Henry E. Holmes, Seattle; Emil Bories, Seattle; J. H. Day, Dayton; Sophus Joergensen, LaConner; J. W. McArthur, Spokane.

Respectfully submitted,

HENRY E. HOLMES.

CHARLESTON, S. C., September 6, 1902.

DR. H. M. WHELPLEY, *President of the American Pharmaceutical Association, Philadelphia, Pa.*

Dear Sir: As your delegate to the South Carolina Pharmaceutical Association it affords me pleasure to make the following report:

Your delegate was courteously and cordially received at the twenty-first annual meeting of the South Carolina Pharmaceutical Association, held in this city on the 21st and 22d of May last. The meeting was called to order at 10:30 a. m. at the Freundschaftbund Hall by President Owings, of Columbia, S. C.

Principally routine business was transacted. Your delegate took part in the proceedings and called the attention of the members to the Jubilee Meeting of the American Pharmaceutical Association, and intermingling with them, endeavored to obtain new members for the national organization, and succeeded in obtaining a few names.

With regret that I cannot be present at the fiftieth anniversary of the Association, and extending my congratulations,

Yours very truly,

C. P. AIMAR,

Delegate to South Carolina Pharmaceutical Association.

Mr. Mayo then arose and said:

Mr. President, Ladies and Gentlemen: As we are about to bring to a close this, the most memorable meeting in the history of the American Pharmaceutical Association, save one, I should like to call attention to the particularly generous manner in which we have been received by our fellow-workers in pharmacy here, and also to call attention to the fact that at this meeting we have had in attendance nearly a thousand members and friends of the Association. Our deliberations have occupied the full measure of a week. Nearly a hundred original communications have been presented, on the widest possible variety of topics. Our proceedings will fill more than a thousand printed pages. Our attendance covers the whole of the United States and Canada from Texas to Nova Scotia and from the Atlantic to the Pacific coast; among it have been numbered eighteen former Presidents of the Association, and we have heard from the lips of one of the oldest living members, the first paper presented to this Association. Our hosts, the local members, have provided for us entertainments filling to repletion every moment of our waking hours; *but* in spite of all this, ladies and gentlemen, I say to you that this has NOT been the most important meeting in the history of the Association.

At *the most* important meeting in the history of the organization, instead of an attendance of a thousand, there were only a score of earnest workers present—instead of a full week, that meeting lasted but a single day. In lieu of the hundred papers which we have had before us for our consideration, *they* were content with informal but earnest discussion. A score of pages suffice to record their proceedings, instead of the thousand which will be required by this meeting. Only four cities were represented, instead of the liberal representation which we have with us here from every section of this broad and beautiful land, and yet, I say to you, ladies and gentlemen, that *that* meeting of the Association, small in number, brief in duration but altruistic in inspiration, gathered in the comparatively obscure quarters of the Philadelphia College of Pharmacy, vastly exceeded in importance the imposing gathering of men famous in pharmacy throughout the world who have honored us with their presence on this occasion.

For at that apparently insignificant meeting those high-minded, unselfish enthusiasts,

filled with the noblest aspirations for the elevation of their calling, planted a seed which has brought forth the American Pharmaceutical Association. That seed fell on fertile ground among the pharmacists of this country, was carefully tended and nourished in its early years, until it now stands like a mighty oak rooted deeply in the hearts of the leaders of pharmacy all over the United States, and spreading its protecting branches over all the varied and diverse interests of pharmacy throughout this broad land of ours.

That earlier meeting, therefore, and not this held 50 years later at the same place, is entitled to rank as the most important in the history of this organization, and it is to those pioneers who founded the Association that we have rendered homage on this our jubilee meeting. But these men who established the lofty ideals which have dominated pharmacy in this city of brotherly love for the past half century have left behind them worthy sons of noble sires, and to these descendants we are individually indebted for the privileges and the pleasures which have been ours during this jubilee meeting.

It would be impossible, Mr. President, for one to enumerate each individual to whom thanks should be returned, for we are assured from the results which have been achieved that every one of the thousand pharmacists of this city has manfully done his share towards making this meeting a success in every possible aspect.

Therefore, Mr. President, I move you a sincere vote of thanks on the part of this organization to the Local Secretary, Mr. Cliffe, to whose personal popularity and executive ability we are so largely indebted for the enthusiastic co-operation of the local members. To the Philadelphia Association of Retail Druggists for the generous entertainment and to Mr. George M. Beringer and his associates of the Committee on Semi-Centennial for the instructive and entertaining program and exhibit which they have provided for us. To Mr. Thos. P. Cook and his associates upon the Committee of Commercial Exhibits which have proven a source of interest and a means of instruction to so many of our members. And to the pharmacists of Philadelphia at large, all of whom have done so much to make our stay here agreeable and entertaining. To the special delegates to State Associations. And, finally, Mr. President, I move you a special vote of thanks to the ladies who have sacrificed their domestic comfort to be with us to add by their grace and charm the final finishing touch which will make of this meeting, if not the most important in the history of the Association, certainly the most important and delightful in the memory of those who have been privileged to be in attendance.

Mr. Mayo's remarks were cordially received and generously applauded.

MR. SHEPPARD: I rise to second this motion with enthusiasm, and I hope you will forgive me if I, as Treasurer, take particular pride in one name that has been mentioned there—the name of a very quiet man, who never talks in our meetings, but who can nevertheless hand in his check for \$950.16, after all the expenses of the exhibition we have seen and enjoyed here have been paid in full and everything cleaned up. I take a great deal of pleasure in showing this check (exhibiting it before the audience), showing the business ability—not to mention the modesty—of Thomas P. Cook. [Applause.]

Mr. Mayo's resolutions were then adopted by a unanimous rising vote.

The President stated that, if there was no further business before the Association, he would appoint ex-President Hancock (1873) and ex-President Sander (1871) a committee to escort the President-elect to the platform, that he might be duly installed.

These gentlemen performed that very pleasant duty, and Mr. Hancock, in introducing Mr. Payne, said:

Mr. President, Ladies and Gentlemen: We have had one week of unalloyed pleasure,

but now the hour has come when you must be inflicted with *Payne*. [Laughter.] I will now let this exhibition of Payne express himself.

Mr. Payne then said :

Mr. President and Fellow Members of the American Pharmaceutical Association: I deeply appreciate the distinguished honor that you have conferred upon me, the highest honor in the gift of American Pharmacy, and will earnestly serve you to the best of my capacity. Success is usually due to either genius or hard work; many of us not having the genius, we must depend on hard work; so of those of you who have the genius, I beg some of your brilliancy to illumine our administration, and of the workers I also beg your hearty co-operation and assistance, that we may make this first year of our second semi-centennial a shining example for the following years. Some of you may be in the fix of an old colored woman for whom I was requested to put up a prescription some time ago. A negro came into my store one day and said: "Boss! I want you to put up this subscription for a powerful poor old cullud 'oman; please make it as cheap as you kin, becuse she gits her money by hard licks, and it's *mighty few* hard licks she kin make."

Of those of you who cannot make many hard licks, I beg, in the words of the Hoosier farmer, James Whitcomb Riley, that you

"Jest do your best, the praise, the blame
That follers that counts jest the same.
I've al'ays noticed that success
Is mixed with troubles more or less,
And it's the man who does the best
Who gets more kicks than all the rest."

Let us strive onward and upward. Pharmacy will be what we make it. Let us make it what we wish it to be. Our country is passing through a period of tremendous evolution, and we must be up and doing, that our business and our profession should be recognized as it deserves.

The new President's remarks were heartily applauded.

RETIRING PRESIDENT WHELPLEY: Members of the American Pharmaceutical Association, in fulfilling my duties as retiring President I have great pleasure in investing Mr. George F. Payne, of Atlanta, Georgia, with the insigna of office (fastens the President's badge on his coat), and providing him with the gavel (suiting the action to the word) with which he is to preside at our next meeting at Mackinac Island, August 10th, 1903. I notice, Mr. President, that you hesitate to receive these tokens of office, but I beg to remind you that no man knows his capabilities until he has made a trial of them.

Now, fellow-members of the American Pharmaceutical Association, I have endeavored to give you my best efforts as a presiding officer, and my term of office having expired, I am ready to retire from that position and take my place among my fellow-members and go to the obscurity whence I came one year ago; but I cannot do so without expressing my thanks to my associate officers and the members of the various standing and special committees for their hearty co-operation in the arduous work of the past twelve months. Gentlemen, I thank you one and all. [Great applause.]

President Payne took the chair.

The same committee was named to escort First Vice-President Cliffe to the platform, and they brought him forward amid the applause of the convention.

The President said :

Gentlemen of the American Pharmaceutical Association : I present to your consideration our distinguished First Vice-President, Mr. Cliffe, of Philadelphia, whom you all know so favorably and so well—not with *Payneful* thoughts, but with the greatest pleasure and enjoyment. [Applause.]

Mr. Cliffe then said :

Ladies and Gentlemen of the American Pharmaceutical Association : I am sure I appreciate very highly this evidence of your regard. I feel that this honor has come to me as the representative of the committee that has done what it could for you during your stay in Philadelphia. I know you have been appreciative of what has been done, because you have expressed yourselves to me personally, and to other members of the committee, and I am sure they all feel as I do about it. The work of the committee has been a labor of love, and thoroughly agreeable to them in every way. They feel that you have made their work as light as possible, and they thoroughly appreciate your evidences of satisfaction with their work. Again I thank you. [Applause.]

Second Vice-President Eberle, of Texas, was escorted to the rostrum by the committee, and the President introduced him, saying :

Members of the American Pharmaceutical Association : I present to you your Second Vice-President, Mr. Eugene G. Eberle, of Texas, that great State where they do things on such a large scale. They have even their oil wells on fire at present, I am informed, probably the largest pyrotechnic display in the world. I present to you Mr. Eberle, of Texas. [Applause.]

MR. EBERLE: Mr. President and Members of the American Pharmaceutical Association, I assure you I appreciate the compliment you have paid me, for I would regard it an honor to be selected by you to fill any position, or to be placed in the discharge of any duty; and if there are any duties to perform as Second Vice-President, and I have the ability to perform them, I assure you I will make an effort to do so. Gentlemen, I thank you. [Applause.]

THE PRESIDENT: I understand our Third Vice-President, Mr. Henry Willis, of Quebec, has gone home, and we cannot, therefore, install him, but he is duly elected to that office.

The President then called for the three new members of the Council, Messrs. Henry M. Whelpley, John F. Patton and C. S. N. Hallberg, and Mr. Whelpley and Mr. Hallberg came forward under escort of the committee, Mr. Patton being absent.

THE PRESIDENT: Gentlemen, permit me to introduce to you two of our new members of the Council—new only in name, but old in good works. One of them, if you will notice, weighs enough to balance up some of the lighter weights of the other officers—and he has it in gray matter, as well as in avoirdupois. I submit them both to your distinguished investigation, that you may look them over and see what you think of them. Our third member of the Council is not present, and we cannot present him this evening.

MR. WHELPLEY: Mr. President, our handsome member, Mr. Patton, is absent, but our speaker—our orator—Mr. Hallberg, is with us. [Applause.]

MR. HALLBERG: Mr. President, ladies and gentlemen, the speaking that I am to do is to be a function of peculiar character, and is reserved for the sessions of the Council, if I am correctly informed. I thank you. [Applause.]

The General Secretary, Treasurer and Reporter on the Progress of Pharmacy were called for, but Mr. Caspari explained that speeches from those officers had been dispensed with in the last few years. The President stated that these gentlemen could not be regarded as fossils, although long in office, for they continued to do splendid work for the Association, but said he presumed they would have to be excused from making acknowledgments if they insisted on it.

The President then announced the following as Delegates to the meeting of the National Wholesale Druggists' Association, soon to occur :

Caswell A Mayo, of New York, *Chairman*.

M. N. Kline, of Philadelphia.

W. L. Dewoody, of Pine Bluff, Ark.

Wm. M. Searby, of San Francisco, Cal.

Theodore F. Meyer, of St. Louis.

Also the following as delegates to the meeting of the National Association of Retail Druggists, to take place at Cleveland this month (September) :

George L. Hechler, of Cleveland.

William McIntyre, of Philadelphia.

D. W. Curry, of Georgia.

Leo Eliel, of South Bend, Ind.

A. B. Rains, of Columbia, Tenn.

There being no further business before the Association, Mr. Mayo moved that this session do now adjourn, and that the local Secretary be empowered to call a session for a later date for final adjournment.

Mr. Lowe seconded the motion, and the convention then adjourned.

CHAS. CASPARI, JR., *General Secretary*.

THIRTEENTH SESSION—MONDAY, SEPTEMBER 22, 1902.

First Vice-President Cliffe called the Association to order at 3 o'clock p. m. In the absence of the General Secretary, the chair appointed C. B. Lowe to act as Secretary pro tem.

Numerous letters were read relating in a complimentary manner the experiences of a number of members during the 50th anniversary sessions during the past two weeks.

A communication from D. E. Prall, of Saginaw, Mich., declining election as Local Secretary for the next meeting, was read and referred to the Council for action.

There being no further business before the meeting, adjournment occurred until the next annual meeting at Mackinac Island, Mich., August, 1903.

C. B. LOWE, *Secretary pro tem*.

OBITUARY OF WM. H. PEABODY.

(Received too late for publication in the Report of the Secretary of the Committee on Membership.)

William Huntington Peabody, of Buffalo, New York, was born in Lebanon, Conn., on February 9th, 1836. In 1847, when but a mere boy, his parents moved to Buffalo, New York, where he received his early education. At the age of thirteen he became fascinated with the study of pharmacy in this way. One morning on his way to school, he stopped in at Mr. Matthews' drug store to see his cousin who was holding a clerkship there. It was in the year 1849, when cholera was raging in Buffalo. He was asked to deliver some medicine, which he did. He afterwards called frequently at the store for this purpose, until finally he decided to learn the business and regularly entered the employ of Mr. Matthews. Beginning at the bottom, he gradually worked his way up until he became head clerk. During part of this time Mr. Frederick Stearns, of Detroit, and E. R. Durkee, of New York, were fellow clerks. In 1857, when Mr. Peabody had reached his twenty-first birthday, he decided to start in business for himself, and with this end in view he had already at home many of his tinctures, extracts, etc., so that he only needed a store in order to commence business. He took a trip West, and practically decided to locate in Cincinnati; but when he returned to Buffalo to settle his affairs, to his surprise many of the leading physicians, among them Dr. James P. White and Thomas F. Rochester, urged him to open a store in Buffalo, which he did. His first and chief store was located on the northeast corner of Main and South Division streets, which he operated until ill health obliged him to give up the same. By close attention to business, he amassed a great fortune and retired very wealthy. He took a great interest in his chosen profession and was identified with a number of pharmaceutical associations. He died on December 27th, 1898, leaving to survive him his widow, Eliza Purdie Peabody, a daughter, Elizabeth Peabody, and two sons, W. H. Peabody, Jr., and Charles M. Peabody.

Deceased was a life member of our Association, and one of its oldest members, having become identified with the same in 1857, at the meeting held in Philadelphia, Pa.

MINUTES

OF THE

SECTION ON COMMERCIAL INTERESTS.

FIRST (AND ONLY) SESSION—TUESDAY AFTERNOON, SEPTEMBER 9, 1902.

The first and only session of the Section on Commercial Interests was held in the convention hall of the Hotel Walton, and was called to order at 3 : 20 p. m. by Chairman Meissner.

The Chairman asked Mr. Mittelbach, of Missouri, to preside while the Chairman's Address was being read and considered, and then presented the following :

FELLOW MEMBERS OF THE ASSOCIATION: One of the objects which the American Pharmaceutical Association is endeavoring to attain as declared by its constitution is "to encourage such proper relations between druggists, physicians and the people at large as may promote the public welfare and tend to mutual strength and advantage."

If the worthy objects here outlined are to be attained, how essential is the maintenance of the Commercial Section? It is indeed gratifying that on the fiftieth anniversary of our Association's birth into the pharmaceutical world, this Section should be receiving at least a fair degree of the attention it deserves.

In the course of his excellent address as chairman of this Section last year, Mr. Rapelye said, "I do not wish to be understood as underrating in the least the important scientific work that has been and is being done by this Association, and without which it must fall, but I do wish to emphasize the necessity for more attention to plans for the alleviation of the confused condition which exists in our business to-day." To this sentiment, which has my hearty approval, I wish to add that unless the requisite amount of attention is given to the difficult problems which the rank and file of druggists of America are constantly endeavoring to solve for themselves because their welfare as pharmacists and as business men is bound up in these problems, this organization will lose the confidence and support of these men, the membership roll will shrink, and the American Pharmaceutical Association will, within a few years, cease to represent any other than the professional interests of pharmacy. I do not put forth this statement as a warning, but I have no objection to its being so considered.

It is not creditable to the druggists of America that the American Pharmaceutical Association represents in its active membership fewer than three per cent. of their numbers. Dissatisfied as we may be that such is the case, we must acknowledge the truth that the commercial interests of pharmacists are engaging their attention to a greater extent than

their professional interests, and that, if this Association is to have the sympathy and financial support of a larger proportion of these men than it now has, it must devote itself more sedulously than in the past to those interests which, wisely or unwisely, are receiving the greater share of their attention.

It is not my wish to lecture the Association on its duty to the 40,000 druggists of America. However, my desire to increase the usefulness of the Association prompts me to suggest that the impression which exists among the rank and file of druggists that the American Pharmaceutical Association is not in sympathy with them and their desires and aims, must be constantly combatted. The disposition said to be characteristic of the members of the American Pharmaceutical Association to stand aloof and to criticise with an air of disdain, if not conscious superiority, the efforts which the every-day druggists of the country are making to better their financial condition, must give place to assurances of the heartiest interest of our members in these efforts, and active measures should be taken to supplement these endeavors by well-directed activity on our part in helping forward their work.

The formation of the National Association of Retail Druggists was caused by the determination of druggists, whose commercial interests had been interfered with, to secure for themselves all the benefits obtainable from co-operation by those whose interests were alike disastrously affected. It was an indication that the American Pharmaceutical Association was not yielding (probably because of structural peculiarities or other reasons) the needed protection. It is greatly to the credit of the National Association of Retail Druggists that since its formation that Association has carefully minded its own business, has co-operated with us wherever it could find an opportunity, and has at all times becomingly acknowledged the preëminence of the American Pharmaceutical Association, because of its honorable career of usefulness and its undoubted worth in certain fields. What has been the attitude of the American Pharmaceutical Association toward the National Association of Retail Druggists? Has that Association received from us the same degree of consideration? Is there no ground whatever for the complaint that those who have found fault oftenest with the policies and plans of the National Association, who by precept and example have placed the greatest obstacles in its way, are men who are prominent in the American Pharmaceutical Association? That these charges have been brought cannot be denied; it is sincerely to be hoped that they are not justified. No one should ever be asked to hide his convictions; freedom of speech is one of the boons of our civilization. But the place to criticise the policies and plans of the National Association of Retail Druggists is in the councils of that Association. Those who are not willing to discuss these questions where their objections can be met and their arguments accepted or rejected on their merits, would do well to preserve a discreet silence and not raise up, needlessly, enemies for the American Pharmaceutical Association.

My reason for giving this matter so much attention is this: The American Pharmaceutical Association should, in my opinion, express so clearly its sympathy with every honest effort to improve the condition, professional or commercial, of the druggists of America, and the members of this Association should so deport themselves with reference to the men and the associations that are endeavoring to secure these benefits, that there can be no justification for the claim that the American Pharmaceutical Association represents exclusively the professional branch of pharmacy, that both the Association and its members are intolerant of relief measures intended to cure commercial ills, and that the American Pharmaceutical Association has therefore no claims on the ordinary druggist. It should be distinctly understood that the American Pharmaceutical Association stands for whatever is for the best interests of pharmacy, and that it honors *all* men and *all* measures having for their object the welfare of pharmacists.

Inasmuch as both of the National Associations are working to improve the welfare of

the pharmacists of America and both are well fitted to accomplish that portion of the work to which their energies are being directed, every consideration urges that the fullest co-operation between the two should be encouraged. To this end I would recommend that if such an arrangement is feasible, the meetings of the two national conventions be held simultaneously. Being purely a business organization it is not practicable to subject the delegates from the various component bodies of the N. A. R. D. to travel great distances to attend the annual convention; for this reason it is desirable that the joint meetings be held somewhere near the center of the country.

The getting together of the two organizations would be rendered much easier if the American Pharmaceutical Association should hold its meetings not too far from the geographical centre of the country. This subject is commended to the favorable consideration of the Committee on Time and Place of Meeting.

It is customary for the Chairman of this Section to discuss in detail the various evils, correctable and incorrectable, which interfere with the commercial success of pharmacists; but I shall depart from this custom and direct your thoughts at once to that which, in my opinion, is the best remedy for these ills. Do not understand me as believing that all of the parasites that prevent the growth and development of the commercial interests of pharmacists can be destroyed. Some of these seem to have taken hold of the very roots of the tree, and their destruction is well nigh impossible, without destroying the tree itself; but no time should be lost in pruning it, thereby getting rid of the abuses which we can eradicate.

The first thing to do is to put aside at once and forever the disposition which some druggists have developed, of complaining because conditions are not more satisfactory. We are told sometimes that the pessimists are a blessing to society, but for my part, I have never believed it. The people who *do* things (I mean the things worth doing) are invariably *hopeful* people, and because they *are* hopeful they are buoyant if not enthusiastic. That conditions are bad enough no one will deny. This is probably all that need be said on this subject. Now then, how can they be remedied? In the first place, *organize*; in the second place, *organize*; in the last place, *organize*. Bear in mind this fact, which is the keystone of the whole situation: The evils that can not be removed as the result of attack by the organized drug trade cannot be removed at all, and must of necessity remain uncorrected, and should be endured uncomplainingly.

But are there any abuses which thorough organization will not eradicate? Very few indeed, if any. The scope of this paper will not allow an exhaustive discussion of this subject, but let us consider that greatest of all the evils that afflict the drug business, *price-cutting*. I am not mistaken when I assert that price-cutting can not resist organized effort. In the largest city in the United States the price of advertised dollar goods is now 37 cents, and these prices are blazoned in every newspaper and displayed in the windows of many drug and department stores. In the second largest city, the lowest price on any dollar article is 76 cents, and only six or seven advertised proprietaries are sold at this price, the figures on the others ranging upward to 93 cents, these being the prices now charged by those who were formerly aggressive cutters. In the last named city two-thirds of the druggists sell *all* proprietaries at one hundred cents on the dollar, and there is no advertising of proprietaries in the public prints at any cut price. In the city first mentioned there is practically no organization; in that last named, organization is thorough and complete.

A homely adage avers that the proof of the pudding is in eating it; here is a list of evils that organization has been known to cure: Price-cutting on proprietaries; price-cutting on ordinary counter goods and heavy drugs, also paints and oils; price-cutting on prescriptions and the practice of "shopping" on prescriptions; the trading-stamp nuisance with its train of evils; backbiting and bitterness among neighbors; unreasonably long hours and the keeping of stores open all day Sunday; dead-beat credit

customers; dishonest and inefficient clerks; physicians dispensing, and the practice in which the agents of some pharmaceutical manufacturing houses indulge of poisoning the minds of physicians against pharmacists, in order to induce them more easily to enter upon the practice of self-dispensing. There have been instances where the establishment of an unreasonably large number of stores in a given community has been prevented by organization. I do not want to incur the risk of being misunderstood regarding the benefits I have named. When I speak of price-cutting on proprietaries being stopped I do not mean that in *every* case the price of dollar goods has been restored to a dollar; what I do mean is that the price established has always been an advance over former figures, with the prospect of still better prices. However, in scores of communities full prices have been restored, difficult as this task may seem.

Neither do I mean to say that all the advantages enumerated have been enjoyed in any one community at one time. The only reason they have not been so enjoyed is the fault of the ought-to-be beneficiaries themselves in nearly all instances. If you inquire why the benefits of organization are not more generally enjoyed by druggists, I answer, because at first it is often hard, disagreeable work, and even when the benefits have been secured, eternal vigilance, the investment of a little money, and an infinite deal of tact are required to insure their continuance. The greatness of the benefits which have followed the organization of local societies, especially when these societies have been backed up by a national association, whose aim it is to supplement the work of the local bodies, has been an extremely agreeable surprise to the druggists of many communities who had practically abandoned all hope of improving their financial condition. It is not to be wondered at that the National Association of Retail Druggists has made for itself so large a place in the affections of the druggists of a large number of communities throughout the country.

Whatever may be said to the contrary, business education is almost as badly needed by young men entering upon the drug business as pharmaceutical education. The crude and wholly inadequate ideas about business, which even some mature druggists hold, are almost pitiable. In my opinion every school of pharmacy ought to include in its curriculum a course of book-keeping, and graduates should have a well-grounded knowledge of how to run a drug store, so as not to collide with the chattel mortgage laws or drive headlong into the trap of a wholesale drug schemer, who, in spite of all previous fair promises, will hold the captive in galling bondage.

- One of the most serious obstacles in the way of the average retail druggist's business success is the groove-like life he leads—his want of contact with other men whose experiences are identical with his own. A friend with whom I was discussing the difficulty of helping druggists said recently, "What can you expect of a man on whom the sun never shines? He goes to his work in the morning before the sun is fairly risen, he goes home at night long after everybody else is in bed. How do you expect such a man to be normal?" Much or little as there may be in this suggestion, one thing seems to be assured; druggists must deport themselves like other successful business men if they would succeed. Nothing sharpens a man's wits like taking note of how the other fellow manages, copying his good points and avoiding his errors. Journal and newspaper reading will never yield this information, only personal contact will supply it.

Mistaken ideas as to what are legitimate fields for competition are the shallows in which many a good ship has foundered. Price demoralization, the department store method of selling something "just as good," and selling some things far below cost in order to bring people to the store, shrewd moves to checkmate one's business neighbors for temporary advantage—these things seem to succeed in some instances; but this country is full of cities and towns where the drug business is utterly devoid of profit for any one engaged in it, because some druggist or department store manager, vainly counting upon his own peculiar and unusual abilities, has undertaken to get the better of his

competitors by inaugurating the methods of which I speak, which action became the signal for a campaign of price-cutting, from the ravages of which all have suffered and which all are alike unable to throw off. Properly selected stock, the employment of pharmaceutical knowledge and skill, a cleanly, tastefully arranged, attractive store, effective advertising, proper treatment of patrons, the efficient training of clerks, profitable buying and selling of articles not kept by one's competitors—these things together give full scope to one's abilities, both as a pharmacist and as a business man; and properly used they furnish all the opportunities needed for a successful career.

In conclusion, I want to say a word to the many new members who, greatly to their credit, have identified themselves with this Association. The A. Ph. A. prides herself upon her half-century of past usefulness, but what she has done in the last half-century is little in comparison with what she ought to do in the next half. The drug store training which most of you new members have had, qualifies you to examine with intelligence the questions with which this Section has to deal, and we invite you most cordially to take up with us the task of solving these problems so that we, and those who follow in our steps as pharmacists, may find in the American Pharmaceutical Association the worthy arbiter of their commercial and professional interests which the founders of the Association intended it should be, setting for us an illustrious example of devotion to this high ideal.

The address of the Chairman was received with applause.

THE CHAIR: Gentlemen, you have heard the address of your Chairman. What is your pleasure?

Mr. Morris moved that it be received and adopted, and the motion was seconded by Mr. Mason and carried.

Chairman Meissner resumed the chair.

THE CHAIRMAN: Are there any reports from committees? Committees were appointed last year to report at this meeting, I believe. If there are no reports from committees, I will read a matter that was referred to the Commercial Section by the Second General Session this morning. The Committee on President's Address made the recommendation, referred to this Section, "that the American Pharmaceutical Association endorse the Joy Bill (H. R., 178) for the reduction of the tax on alcohol to 70 cents per proof gallon." Gentlemen, what will you do with that recommendation? The general session requests the action of the Commercial Section.

MR. MAYO: I move that the Commercial Section endorse the recommendation of the President, and request the endorsement of the general session. That is the usual routine. This Section has no authority to pledge the Association to the endorsement of anything; all we can do is to express our desire that the general session approve of this bill. I, therefore, move that the Section recommend the adoption of this suggestion.

Mr. Gibbard seconded the motion.

MR. HYNSON: I think this Section ought to well understand what it is doing in endorsing this recommendation of the President—which I am fair enough to say was also endorsed by the committee to whom the President's address was referred. You want to know what you are going to endorse in the reduction of an internal revenue tax on alcohol. You want to be very careful in your action. If this Section proposes to endorse that resolution in favor of the reduction of the tax on alcohol, it carries with it a recommendation from this Section to the general Association; and if it is adopted there,

the American Pharmaceutical Association will go on record as favoring the adoption of this bill, and a reduction of the tax accordingly. Personally, I am opposed to the reduction of the tax on alcohol. [Applause.] I have no axe to grind, but the question is, Do you want to apply this reduction to the price of your goods? The trouble with the drug business to-day is not so much the percentage of profits, but the net profits; and if you continue to lower the price of drugs, you continue to make them cheaper, and they appear cheaper to the public. We do not want to cheapen or lessen the amount of our gross business or our gross profits. Now, we are doing that by favoring this resolution. The only men benefited by this would be those who have fixed prices on their goods—who already have their prices fixed. Those who have no fixed prices must lower them. Every one of you will be selling tinctures for five cents an ounce, and you will abolish your profit. I want this matter considered carefully. I think this Association, and this Section, should think well before going on record as favoring this reduction.

MR. WOOTEN: The question of whether or not the tax on alcohol shall be reduced from \$2.06 per wine gallon to \$1.31 is a question which concerns every retail druggist in the United States. The gentleman who has just spoken apparently forgets that there are very few retail druggists who do not make their own preparations—preparations into the composition of which alcohol enters. There is no reason why this additional tax of 75 cents per gallon should be paid on that alcohol which enters into these preparations. One reason why I cannot see the difficulty he apprehends in reducing the tax on alcohol lies in the fact that the retail druggists of this country are learning the lesson, though slowly, that it is not necessary that they should reduce the prices on their preparations simply because the cost of manufacture is lessened. Every organizer who goes out from the National Association of Retail Druggists is schooled in the work of showing the retail druggists that they are giving away their profits needlessly to the public, and without any compensating advantage to themselves. There is no good reason why the price of tinctures should be reduced to five cents an ounce, as the gentleman says. There is no good reason why fluid extracts and other liquid preparations into the making of which alcohol enters should be sold at a poor profit. If the retail druggists of the country would only have the good judgment to pool their issues, there is no reason why there should be any reduction whatever in the prices of these preparations. There is no reason, therefore, why this saving of 75 cents per gallon should not, all of it, go into the till of the retail druggists of the country. Nor do I see, as the gentleman who has preceded me does, that the volume of business will be decreased by this reduction. Possibly it would be decreased in the sale of large quantities, but the average retail druggist does only a modicum of that kind of business; his sales are principally ounces and half ounces, and small multiples of ounces. Therefore, I cannot see that this point is well taken. I believe this Association ought to go on record, for a number of reasons, for the reduction of the tax on alcohol from \$2.06 to \$1 31 per wine gallon. [Applause.]

MR. MAYO: In opposing this motion, Mr. Hynson laid considerable stress upon the point, and made the prophecy, that the price of tinctures would be reduced, and it might be well to take a straw-vote, as it were, upon the question of how many druggists advanced the price of their tinctures when the additional Internal Revenue tax was put on.

MR. HYNSON: When was it increased?

MR. MAYO: About three years ago; during the Spanish war.

MR. HYNSON: How much was the increase?

MR. MAYO: The increase was 40 cents a wine gallon, making the tax \$2.46, I believe,

and we have been paying that tax out of our own pockets. I do not think anybody increased the price of his tinctures, though. Now it is proposed to decrease the tax 35 cents a wine gallon below what it was before the increase of three years ago, or a reduction of 75 cents from the present figure, and I am quite confident that only the most radical cutters will try to reduce the price on that account. [Applause.]

MR. ALPERS: This subject was discussed two years ago, I believe, by this Section, as well as in the general session, and if I am not mistaken the trend of the argument at that time was against the position taken by Mr. Mayo here, that there is no reason for reducing the price of articles. This argument is a mere theoretical one. You might say, Why can't we charge more for all our goods? Why not charge one dollar an ounce for essence of peppermint, say? Simply because we can't get it—because there is a fundamental law existing in all these things, that the selling price—the profit—and the manufacturing price will always be in a certain ratio; and from this ratio we cannot get away. It will exist, and it will find its level, even if by some unforeseen or artificial means we charge more than this profit should be. It is a fact that many articles which form a large part of our ordinary sales consist, to a great extent, of alcohol; and the fact that alcohol is expensive, and that we can tell our customers, in a general way, that a preparation takes a great deal of alcohol, and as he knows alcohol is expensive, is a good argument for keeping the price up. This is true of such articles as tincture of ginger, of myrrh, and hundreds of other articles we sell over the counter, and which we get ten cents an ounce for. The competition of department stores and great cutters does not count for much in this case, because they must pay the same as we do for their alcohol. The government gives no cash discount, and no discount for large purchases, and this is the reason why articles of this kind have, in a general way, kept up in price; and we should try to keep these prices up as far as possible. Now, if alcohol is reduced in price the public will soon know it, and cutters and department stores will begin selling these goods at a very low price, and we all know it will soon influence our business. If we have to sell a pint of spirit of peppermint, for instance, for 40 or 50 cents, because alcohol is cheap, we will make a great deal less profit, as Mr. Hynson has stated, than if we sold it for 60 or 75 cents, or even more. From the standpoint of the retail pharmacist, I do not think we should endorse this recommendation to reduce the tax.

MR. BUTLER (of Massachusetts): I do not believe the retail druggist will be benefited by the reduction in the tax on alcohol—I agree with Mr. Hynson and the last speaker in that. There are a good many reasons that might be mentioned, but it is hardly necessary to go into them here. The question is, Who has drawn up these circulars that have been distributed? It is the large manufacturers, hoping to put more money into their pockets. If this tax is reduced the cutters will make a point on it at once, and will cut down the price of these goods. I think it would be a serious mistake for the retail druggist, unless we are here in the interest of the patent medicine manufacturer.

MR. SCHULZE: You all may remember that we were assured that the removal of the stamp tax would reduce the price of goods, but it did not do it. The price of alcohol, as you all know, is now controlled throughout the United States by a combine. Now, have we any assurance that they are going to reduce the price, even if the tax is reduced? In that sense, we are voting to put money into the pockets of men who do not need it. [Applause.]

A vote was then had upon the recommendation to endorse the Joy Bill to reduce the tax on alcohol, and it was lost by a standing vote of 31 for the proposed reduction and 39 against it. [Applause.]

THE CHAIRMAN: The Section will not ask the general session to endorse the Joy Bill.

MR. HYNSON: I hope it is understood that this Section recommends to the general session that the bill be not endorsed.

THE CHAIEMAN: That is not the motion. That will take a new motion. We were simply requested to endorse it, and we refused to do it. The next order of business will be reading of a paper on "The Commercial Section of the American Pharmaceutical Association," by Mr. Henry M. Whitney.

Mr. Whitney arose to explain that, since seeing the paper in print, he was satisfied that it was not worthy to enter the Proceedings, and moved that it be dropped; but on motion of Mr. Whelpley, seconded by Mr. Mayo, the paper was referred to the Publication Committee for action.

The full text of Mr. Whitney's paper was as follows:

THE COMMERCIAL SECTION OF THE A. PH. A.

BY HENRY M. WHITNEY.

It is said that "America is the product of the commercial and industrial age."

And surely this Section of the A. Ph. A. has had a decided influence, not always recognized in the prosperity and success of the Association, and because not boldly claimed, this Section has by some been regarded as a failure. Has any Section ever presented a more exhaustive research, or clearer presentation of facts than was given in Baltimore in 1898? See minutes of this Section in Proceedings of that year, covering nearly one hundred pages, and *not* including Report on the drug trade in foreign countries of 341 pages. Strange, and inexplicable as it may seem, the Association encouraged the organization of the N. A. R. D. and authorized the Section on "Practical Pharmacy and Dispensing," they undoubtedly without intention, giving this Section "leave to withdraw." What the particular point sought for or expected by wiser heads may be, I do not know, but feel assured that time and acts or results will soon develop, and the action be justified.

Now one of the special points of value of this Section I wish to present, is its influence upon the outing or social parts of our annual meetings. It is the commercial spirit and aid which has given life, and a never-to-be forgotten record of travel, sight-seeing, acquaintance with other homes and people than our own,—rest, true joy and comfort, most of us would never have enjoyed, had it not been as members of the A. Ph. A. Nothing can take from us the pleasures we have had, and their value to each and every member, I fully believe, is a hundred fold beyond the cost, if in no other way than the pleasant memories of the past.

We all can recall some author whose writings have given us pleasure—how much more than the mental books we have been making ourselves. These books, each meeting a volume of itself, if written out by the author of "Etidorpha," "Stringtown on the Pike," and other works of fiction and

fact, would find in every meeting I have attended, simple facts of experience which would be as fascinating, astounding, and useful, as the mind of any writer could desire, and every reader would, in recalling his own part in the record, enjoy as much if not more than any work of fiction ever printed. I do not believe any one who attended the meeting in San Francisco, participated in the pleasures there, going and returning, ever used the time and money required for the trip to better advantage as an educational and royal outing. That well-remembered sail upon the great lakes and meeting in Minnetonka, Put-in-Bay, trips to Cleveland and Detroit, the meetings at Asheville, Old Point Comfort, Richmond, St. Louis, and many other places, full of historic interest, so helpful in the appreciation and realization of the growth, development, and progress of our country, the hospitality, kindly greetings, varied entertainments—who does not cherish the memory of them, as among the brightest, happiest, and best days of his life? The meeting in Baltimore was a memorable one, and could not be otherwise, for there is the home of our General Secretary Caspari, Dr. Simon, the Dohmes, and that famous poet, orator, past grand commander, local secretary, the inimitable Hynson. No one can ever forget this “Commissary or Quartermaster-General,” as he called himself, when he greeted us on that hot afternoon of Aug. 29th, 1898. His pride, military bearing, and commanding presence, as he announced the completion of his “preparations for the encampment,” and issued his general orders, will ever be a living picture of a loyal, energetic, genial, facetious, and most trustworthy official. May his shadow, though of good proportions then, never be less. Mr. Corning in his welcome, said in explanation of the orders issued by “Genl.” Hynson, that “the first evening has been devoted entirely to the committee on entertainment, so that they can present themselves before you in dress suits,” etc.

It is most unfortunate that our general and local secretaries of that year were both on this committee, and their modesty or vanity, perhaps both, prevented a detailed record of this first evening. Call to mind some account you have read of a “salon” gathering in the earlier days of Paris, and you can get a faint picture of this royal reception.

Mr. Corning also said we were to be “filled full” upon *one* occasion. I was never able to decide *which* one he had in mind, for upon the “Ice Boat” as we were on the way to Annapolis, and where Admiral Cervera was again captured, and gave many of you his autograph, we were indeed *full*. And that trolley ride to the park was another case of filling, not only of food solid and liquid, but of amusements so varied and unique that words cannot describe. I have never quite forgiven Genl. Hynson for failing to throw that kangaroo—perhaps he was too full. The carriage ride, and personal reception by the Dohmes at their elegant home, were other occasions of filling, and who will ever forget the abundant and most grateful supplies at both ends of the hall where the meetings were held?

The weather was hot, and so were the entertainments, in intensity of whole-souled hospitality. The rotund Redsecker describes his condition on page 446 of the proceedings, calling it "a little bit of a scientific paper." Dr. Simon, the famous mountain climber of the A. Ph. A., a scientist and persistent searcher for facts in every department, at large personal expense, gave us an intensely interesting and instructive lecture on liquid or compressed air. A mystery to nearly every one at that time, was, by experimental and practical demonstration, made as simple as the alphabet—such is the power and service of Dr. Simon.

In conclusion let us recall the meeting at the "Profile House" in New Hampshire, where four of the New England states participated in the entertainments. There is no occasion to repeat in detail the account given in Proceedings of 1892. Those present will recall the reception in Boston, upon Lake Winnepesaukee, Mt. Washington, Crawford House and Portland, Me. Nor will that wonderful electrical storm while at the Profile House, or the great and grand praise service Sunday evening, in which five hundred or more pharmacists and their friends joined, soon be forgotten. Surely in recalling some of the happy experiences of the past, this Section has a right to claim a share of the success of the A. Ph. A. It has always seemed to the writer that the local secretary, who has the opportunity of catering to the comfort and pleasure of the entertainments of this Association enjoys a most enviable position, and if called upon later to accept the position of president, he simply pays for the honor and satisfaction he has had as local secretary. Long may this Association continue its good work, and the Commercial Section insist upon the continuance of the entertainment programme.

Mr. Schulze, of Baltimore, being called upon, then read the following paper, receiving the applause of his audience :

THE COMMERCIAL VALUE OF PHARMACEUTICAL LEGISLATION.

BY LOUIS SCHULZE, BALTIMORE, MD.

In writing a paper on Pharmaceutical Legislation for the Commercial Section, our object should be to prove that legislation of this kind is beneficial to the pharmacist from a commercial point of view, as no one can doubt the benefits from a professional standard ; for as long as there was no legislation compelling pharmacists to equip themselves by years of study and practical training for the profession, so long the number of pharmacists that were properly equipped mentally was not so great as it is at the present day.

If it were possible to have laws enacted in our various States limiting the number of pharmacists according to the population, as is done in most European countries, no doubt they would be of great commercial value to those who were fortunate enough to become proprietors ; but this is utterly out of the question in a country like ours, and we believe it is well it is so,

as under existing circumstances real value and worth have a better opportunity of gaining the reward due them ; furthermore, laws in this land are not enacted for pharmacists, physicians or any other profession or calling, but by and for the people.

That people are best served by a pharmacist who has been properly trained in a school of pharmacy of good repute, to which has been added practical training in a properly equipped and conducted pharmacy, no one can dispute ; hence there should be no trouble in obtaining a legal requirement to this effect, and though the laws of the various States do not require graduation from a school of pharmacy for registration, yet every board of pharmacy should strive to have its examinations on a par with those of the best schools of pharmacy, and under no circumstances omit practical work in compounding and dispensing prescriptions from its examinations. Secondly, the sale of abortives and powerful narcotics is undoubtedly at all times attended with more or less danger ; hence the sale of these should and could, we believe, if the matter were properly presented before the legislative bodies of the various States, be restricted to the pharmacist, and in some cases then only on physicians' prescriptions, not to be renewed except on written order of the prescribing physician. Furthermore, every State should have a law preventing the sale of inferior or adulterated drugs, and the United States Pharmacopœia be made the legal standard in all cases.

This much, we believe, could be obtained ; but of what commercial value are these laws to the pharmacist ?

Firstly, by compelling pharmacists to be educated men, a higher grade of manhood is introduced into the profession, and the number necessarily decreased, which brings about an increase in trade ; furthermore, men of such standing can be more readily appealed to to maintain prices, as well as made to realize the necessity of a reasonable profit in goods handled by them. Restriction of sales of abortives and powerful narcotics by pharmacists should be made from a moral rather than a commercial side ; nevertheless it also has its commercial value, as it prevents their being sold by general merchants, hence restricts competition. By preventing sales of inferior and adulterated drugs, the pharmacist is benefited commercially from the fact that his competitor must handle the same quality of drugs.

That patent medicines are to a great extent responsible for the increased habitual use of narcotics cannot be denied, and laws compelling manufacturers of such as contain these potent remedies to state upon the label the kind and amount of the same, so that the pharmacist could handle them intelligently, would be proper from a moral standpoint, and might also prove valuable on the commercial side.

Mr. Hynson moved to refer the paper to the Publication Committee, which motion was duly seconded and carried.

The Chair called for the reading of a paper by Mr. Hargreaves, of Toronto, entitled, "A Price Protective Plan." Mr. Geo. E. Gibbard, of

that city, explained that Mr. Hargreaves was unable to attend the meeting, and asked that his paper take the usual course. He said that his reason for writing it was because it treated of a matter that had received considerable attention in the Provinces, and it was hoped the paper might be of some benefit to the pharmacists in this country. On motion of Mr. Alpers, the paper was referred to the Publication Committee. The following was the full text of the paper :

A PRICE PROTECTIVE PLAN.

BY JOHN HARGREAVES, TORONTO, CAN.

Pharmacy Acts are presumably framed for public protection. They demand of men who are trained by virtue of these laws, a standard of educational qualification, tending towards greater security of public life. They license these men, after obtaining the education, in order that in their commercial pursuits, every possible protection may be given, and life and health is thereby considered more secure. Are we to believe that governments are unwilling to afford some protection commercially, in return for the standard of qualification they demand and expect? I am firmly convinced that if the inseparable commercial connection of pharmacy and its required qualifications were intelligently and forcibly brought to the notice of our government, they would understand our conditions and energetically assist us in an endeavor to elevate and purify the commercial side of pharmacy. Indeed, I feel that the future professional success of pharmacy depends on the legal recognition of its commercial connection and necessities, and I desire to suggest that the American Pharmaceutical Association should take the initiative in a movement to bring this important question before the legislative bodies of America.

The object of this paper is to draw the attention of your honorable body to the only successful plan for controlling the prices of proprietary articles. With an experience of some twenty years in retail pharmacy in Canada, in which I have endeavored to participate to the best of my time and ability in all important movements which had for their object the advancement of either professional or commercial pharmacy, my conclusions on our mode of regulating prices may be of some interest.

Allow me, somewhat reluctantly, to first state this conclusion, that as the business of a pharmacist is conducted to-day proprietary medicines are a necessary part of the stock in trade. They have become so necessary and so intimately connected with many prescribers, that to be exact, we should class them into professional and commercial proprietary medicines that all progressive and up-to-date pharmacists are compelled to carry in stock.

That cutting of prices of these commercial proprietary medicines is degrading to the moral, professional, and commercial life of pharmacy is generally admitted ; and while associations and organizations have advanced the interest and welfare and the moral standard of druggists, they

are powerless to prevent the cutting of prices. We have attempted by a powerful organization to regulate such prices, believing that our great numbers, when united, could dictate and achieve any result. Do not understand me as deprecating associations and organizations. I am a staunch believer and active principal in organization work, but we have demonstrated that only one power can control prices, the power of the manufacturer. The impossibility of making a numerous body, depending on the loyalty of the pledges of each individual member, a perfect unity, weakens and destroys the effective power of an association to dictate to anybody, while on the contrary, the manufacturer being a perfect unit, he can control the quantity, quality, source, and any other conditions he may desire, to successfully accomplish any proposed result he has in view.

The courts in Britain and the United States have decided, that the manufacturer can dictate conditions on which his product may be marketed, providing he can prove that the conditions existed and were understood by the purchaser previous to receiving product from the manufacturer or his agents. Depending on the strength of these legal decisions, our Association approached a manufacturer in Canada, representing the mutual advantages in favor of controlling the retail price, and induced him to market his goods on a price restrictive plan. The experiment was undertaken in April of this year, with articles marked to retail at fifty cents and one dollar that were then being pushed and rapidly sold at thirty cents and sixty cents. The result at this date has entirely surpassed our most sanguine expectations, and the strongest possible support that retail pharmacists can give, is richly deserved by this manufacturer, who has single-handed pioneered a road and established a procedure of unlimited value to the future of the wholesale and retail drug trade of Canada, and may I not say America?

To be explicit and to produce hurriedly the recorded evidences of our success, I will now state that the article referred to is called Powley's Liquified Ozone, prepared by The Ozone Co. of Toronto. They have secured the following important decisions: John T. Lyons, a retail druggist of Montreal, signed the contract, purchased the goods and immediately proceeded to sell below the stipulated and marked prices. The Ozone Co. entered an action asking damages and an injunction preventing him from violating the contract until trial takes place. The court granted an interim injunction as requested, until trial is heard. Messrs, Skinner & Co., of Kingston, wholesale drug jobbers, signed the contract. purchased the goods, and sold to a departmental store that had refused to sign the contract. Proceedings were immediately taken, when Skinner & Co., after first strongly objecting, consented through their solicitor to a perpetual injunction restraining them from selling Ozone contrary to contract, and also to pay fifty dollars damages, and the costs that had been incurred. Bryson, Graham & Co., a large departmental store of Ottawa,

procured Ozone, and to prevent tracing of the article, defaced the wrapper and the marks on the packages. Proceedings were instituted, with the result that Bryson, Graham & Co. readily consented to an injunction restraining themselves from selling anything as Powley's Liquified Ozone, except in the *original intact* packages.

These legal decisions are exceedingly valuable to every branch of trade, connected with pharmacy or the selling of proprietary medicines, especially so, because though eminent counsel was consulted by the defense in these cases, our plan was so perfect, an immediate settlement was advised and recorded.

In conclusion I have attached hereto a copy of the contracts for the wholesale and retail trade, under which we have accomplished the results related. I desire to repeat my belief that professional and commercial pharmacy are equally degraded by the cutting of prices, and that a solution of this problem is worthy of the most serious consideration by the American Pharmaceutical Association.

Toronto, July 31, 1902.

AGREEMENT FOR WHOLESALE TRADE.

In consideration of the agreement of The Ozone Company of Toronto, Limited, to supply me or us with Powley's Liquified Ozone at the prices set out in Schedule "A," I or we *agree* with the said The Ozone Company of Toronto, Limited, not to sell directly or indirectly, by agents or otherwise, said Powley's Liquified Ozone at less than the prices set out in Schedule "B," and I or we further agree not to sell at any price to any person who has not signed and conformed to agreement set out in Schedule "C."

And the said The Ozone Company of Toronto, Limited, agree with the other party hereto to sell said other party Powley's Liquified Ozone at prices set out in Schedule "A."

Schedule "A," being List of Prices at which Powley's Liquified Ozone will be sold to the Wholesale Trade:

Large size, \$8.00 per dozen. Small size, \$4.00 per dozen.

Discounts:

One gross up to five gross, 10 per cent., 30 days.

Five gross or over, 15 per cent., 30 days.

Schedule "B," being prices below which the Wholesale Trade agree not to sell Powley's Liquified Ozone:

Large size, \$8.00 per dozen. Small size, \$4.00 per dozen.

Discounts:

General, 5 per cent., 30 days.

3 dozen assorted, 5 per cent., and 2 per cent., 30 days.

1 gross assorted, 5 per cent., and 5 per cent., 30 days.

5 gross assorted, 10 per cent., and 2 per cent., 30 days.

AGREEMENT FOR RETAIL TRADE.

The Ozone Company of Toronto, Limited, *for the protection of the trade*, and in pursuance of an agreement entered into with *The Retail Druggists' Association*, require the agreement set out below to be signed by the Retail Trade before the Retail Trade will be entitled to purchase Powley's Liquified Ozone at the prices mentioned below.

*Schedule "C."**Agreement.*

In consideration of the agreement on the part of The Ozone Company of Toronto, Limited, under which I or we become entitled to purchase Powley's Liquified Ozone at the prices set out in Schedule "D," I or we agree with the said The Ozone Company of Toronto, Limited, not to sell the said Powley's Liquified Ozone to any person or persons, corporation or corporations, at less than the prices set out in Schedule "E."

And in consideration of the agreement above set out the said The Ozone Company of Toronto, Limited, agree with the other party hereto that the said party may purchase Powley's Liquified Ozone from the Wholesale Trade at the prices set out in Schedule "D."

Schedule "D," being the prices at which the Retail Trade may purchase Powley's Liquified Ozone:

Large size, \$8.00 per dozen. Small size, \$4.00 per dozen.

Discounts:

General, 5 per cent., 30 days.

3 dozen assorted, 5 per cent., and 2 per cent. 30 days.

1 gross assorted, 5 per cent., and 5 per cent. 30 days.

5 gross assorted, 10 per cent., and 2 per cent. 30 days.

Schedule "E," being the prices below which the Retail Trade agree not to sell Powley's Liquified Ozone:

Large size, \$1.00 per bottle. Small size, 50 cents per bottle.

In $\frac{1}{2}$ doz. lots:—Large size, \$5.00 per $\frac{1}{2}$ doz. Small size, \$2.50 per $\frac{1}{2}$ doz.

Signed.....

Address....

Date.....

Mr. Hynson said he had been requested by Mr. H. A. B. Dunning, who could not be present until to-morrow, to read a paper he had prepared for presentation here, and then read the following:

CAN CHEMICAL ANALYSIS BE PRACTICED BY THE RETAIL
PHARMACIST WITH PROFIT?

BY H. A. B. DUNNING, BALTIMORE, MD.

The study of analytical chemistry has become one of the most important branches taught in pharmacy colleges. This fact indicates that the educators and instructors in pharmaceutical matters have realized that this study is a factor of importance in retail pharmacy. That it is so thoroughly and extensively taught is sufficient guarantee that it is for a practical and remunerative purpose other than the general education of the pharmacist.

Not only does the proper application of the pharmacist's chemical knowledge give him status with the physician and layman (as the druggist who causes himself to be thought a good chemist is very liable to be thought a good pharmacist), but it may also in many ways bring him direct pecuniary profit.

In reference to the pharmacist, chemistry may be divided into two classes: pharmaceutical chemistry and medical chemistry (that which he may do for or under the direction of a physician).

Pharmaceutical chemistry applies to the pharmacist in general ; while the medical chemistry applies more or less to the individual pharmacist, according to his situation and opportunities.

There are numerous reasons why the pharmacist should analyze the chemicals he buys, rather than pay some one else to do so for him. First and foremost, the great profit cleared ; secondly, the protection which is afforded against mistakes of manufacturers and jobbers ; thirdly, the facility with which the analysis is made under the direction of the pharmacopœia.

That it is profitable (considering the first reason), could readily be proven by application. In many cases only from one to two hours are required to analyze an amount of chemical, which should be bought in sufficient quantity to last several months. The tests are readily and easily made. The number of test solutions required are but few, as the probable impurities of chemicals in many instances are the same, and the volumetric solutions required likewise. The test solutions are easily made with the exception of the volumetric solutions. Once having made a good standard volumetric solution then many of the other volumetric solutions are readily adjusted by it. These solutions cost little, but the time required in making them. This is surely little trouble to save very often one hundred per cent. on the cost of chemicals.

Many chemicals constantly used in more or less large quantities in prescription work and for general use are required to be of a high standard of purity and strength. To insure this degree of purity, many good pharmacists buy this class of chemicals from chemists whose names vouch for the purity and strength required. Then they advertise, "I use So and so's chemicals." They might add, "and for which I pay double (most always) the price required for a chemical as suitable ; only there is no voucher to that effect and I am too busy (he might say too lazy) to apply the tests prescribed by the Pharmacopœia."

Chemicals which equal the requirements of the Pharmacopœia are of sufficient purity for any medicinal purpose. The Pharmacopœia was compiled by our most able men at a great expense and an expenditure of much valuable time ; greatly for the use of pharmacist or physician in proving the strength and purity of the chemicals which are of general use in their professions. It would be a very regrettable matter if all this valuable work is to be thrown aside.

The analysis of your chemicals allows you the opportunity to say to the physician and customers : "We use only pure chemicals in your prescriptions and orders. We test them ourselves." If the physician and particularly the layman have a good opinion of your general ability as a pharmacist, they would rather have you assure them that your chemicals are tested by yourself than by some expert chemist.

For those who buy tested chemicals, a comparison of prices should

startle them : Sodium bromide, costing \$1.09 per pound, may be bought for 66 cents ; potassium bromide, 90 cents, for 60 cents ; alum, 15 cents, for 5 cents ; boric acid, 36 cents, for 15 cents, etc. The above prices were copied from the price list of two chemists. The former chemicals were vouched for ; the latter the pharmacist should vouch for, and make the difference in cost.

It is by no means suggested that you simply test chemicals to ascertain their degree of purity, but if they are of sufficient purity to be accepted. If they are not, then return them and get others, or buy from another house, then if unable to obtain a satisfactory chemical, buy through experts. It is certain that United States Pharmacopœia chemicals can be bought from other than high-priced expert chemists.

It is not intended to intimate that certain chemists charge excessive prices. Their price in excess of the other chemists is the amount they make for their analysis of the chemicals and purification, if required. The Pharmacopœia allows a certain amount of impurity, the impure substance or the amount of it being harmless and an unnecessary expense to remove. This amount is a maximum limit, and in examining chemicals the amount of impurity should not be allowed to exceed that limit.

It will be found, upon examination, that most of the chemicals on the market made by reputable manufacturers are of such purity that they rarely exceed the amount of impurity allowed by the Pharmacopœia, and equal the strength required. This fact of course makes the examination of chemicals more feasible and lessens the time required in making an analysis.

A number of "lots" of chemicals tested were ascertained to be usually of about the same purity and strength. With some few exceptions, they answered all the requirements of the Pharmacopœia. Magnesium sulphate has always given a too persistent sodium flame, and an excess of chloride has always been indicated, usually about two per cent., otherwise magnesium sulphate is very pure. Two per cent. of chloride in magnesium sulphate will scarcely do any harm.

Chlorides in excess of the limit (three per cent.) are usually present in potassium bromide. Upon writing to a leading manufacturer of chemicals concerning the impurity of potassium bromide, he replied that the American bromine, so largely used in the manufacture of bromides, was so contaminated with chlorine that it is difficult to make a salt which would not exceed the limit without unnecessarily increasing the cost of the chemical. The samples examined usually contained 3.1 to 3.3 per cent. of chlorides. Although this is little in excess of the limit, it is, naturally, better that the impurity should not equal it, therefore it is a bad feature should the limit be exceeded at all. Potassium bromide otherwise has been found of great purity, as has alum, boric acid, Rochelle salt and other chemicals.

Potassium iodide is often contaminated with an excess of alkali, which causes a yellowish instead of a bright crystalline solution. With this exception, it has been found very pure.

In a comparison of sodium bicarbonate costing six cents per pound and a standard chemical costing fourteen cents, the same degree of purity was ascertained of each, including the 99.6 per cent. strength.

It has been reported that some of the commercial chemicals are of such purity that they only require testing by the expert chemists. Without further purification, they are put in their own packages with their labels attached. The instance of the sodium bicarbonate mentioned above would seem to indicate the truth of this report.

In regard to sodium bicarbonate, it is suggested that instead of using the United States Pharmacopœia method of titration, with methyl orange as an indicator, a residual method be used with phenolphthalein as indicator. The reason for this suggestion is that with the methyl orange the tint of yellow, indicating neutrality, is very difficult to decide. If an excess of the acid volumetric solution be added to the specified amount of bicarbonate, liberating all the carbon dioxide at once, then the solution boiled to free from carbon dioxide (the acid properties of which act upon phenolphthalein), the excess of acid estimated with alkaline volumetric solution, the amount of alkaline volumetric solution subtracted from total amount of acid solution used will give the amount of acid solution required to saturate the bicarbonate. This method, for general use, is much easier and more accurate for the estimation of carbonates and bicarbonates than the pharmacopœial method. If the pharmacist should not deem it necessary to make a complete examination of the chemicals received, then let him, for his own safeguard against the mistakes of the manufacturer and jobber, make the few tests of identity.

There are two instances recalled of mistakes of the above character, one of which causes much confusion and doubtless some loss of confidence in the pharmacist concerned. A fifty-pound lot of a chemical purporting to be boric acid was bought from a very reliable manufacturer. The powdered chemical was put up in quarter-pound, half-pound, and one-pound boxes for general distribution. Doctors, nurses, and laymen bought the substance and brought it back with the information that it would not dissolve either in cold or hot water. Upon examining this substance it was found to be a mixture of 15 parts acetanilid and 85 parts boric acid, being a stock powder kept on hand by the manufacturer and sent to this pharmacist by mistake. Since that time that particular pharmacist has been examining all chemicals. The other instance was of a ten-pound lot of ether being sold to a hospital. The pharmacist had only removed the jobber's label and put on his own. The physician in charge at the hospital reported his doubts that the substance received was ether. Subsequent examination proved the fluid to be a very poor sample of compound spirit of ether.

Upon the receipt of chemicals the person who has the chemical work in charge should open the package and remove sufficient for analysis.

After analysis, if accepted, it should be emptied into a stock container and entered upon a book kept for the purpose, "Boric acid, 50 pounds, bought of John James, New York, Sept. 22, 1902, lot 411 or keg 77," as it may be; then the remarks as to purity and strength. Upon putting the chemical in packages for general distribution each package should be sealed with a sticker upon which has been printed something to the effect that the contents of this package has been thoroughly tested and found of standard purity and strength. Those receiving packages labeled in this manner will naturally feel secure and satisfied, and there is little doubt but that the pharmacist will have sale for more chemicals than before taking up this work. As was suggested, medical chemistry refers more to the individual pharmacist than the general—meaning that some pharmacists may be better situated and have much better opportunities in this line than others. In the smaller cities and towns this work can be done to a better advantage and with more profit than in larger cities, generally; there being no health board and hospitals to compete with, and rarely physicians who make this line of work a specialty, to offend.

There are a great many pharmacists who find the chemical analysis of urine, gastric juice and other secretions of the body quite profitable. Urine analysis, being more general, is the most profitable; the price very much depending on the class of the analysis, whether qualitative, quantitative, or both, and the number of urine constituents reported upon, a complete analysis paying as much as \$25. There is not a great amount of paraphernalia required for urine analysis, mostly required is time and care. The pharmacist may make analyses of mineral waters, contents of stomach, and any other extemporaneous analysis, if he desire to have a complete analytical laboratory.

A source of some little profit and much advertisement is the making of volumetric solutions for physicians' use, decinormal sodium hydrate and decinormal oxalic acid being mostly required. Sometimes a decinormal or centinormal potassium permanganate, a decinormal silver nitrate and ammonium sulphocyanate, and a few others. A liter of any one of these solutions may be sold for \$1.00, costing mostly a little time.

When taken up in its entirety, or only in part, the medical chemistry is a good advertisement to medical men, and certainly it will be admitted that good advertisement to the physician will bring in good profit to the pharmacist.

The paper was received with applause, and the chair stated that, without objection, it would take the usual course. Discussion was invited, but there was no response.

The chair then called for the reading of a paper entitled "The Pharmacist and His Own Preparations," by Mr. Kaemmerer, of Ohio, and that gentleman presented the following, receiving the hearty applause of his audience:

THE PHARMACIST AND HIS OWN PREPARATIONS.

BY WM. F. KAEMMERER.

A gentleman comes into your store and asks for five cents worth of Epsom salt; after a five minutes' conversation with you he decides that he does not want any Epsom salt at all, that he wants a bottle of citrate of magnesia instead, and purchases accordingly. Are you to be called a substitutor for a transaction like that? A lady comes into your store and asks for a bottle of X's sarsaparilla; after a five minutes' conversation with you she decides that she does not want X's sarsaparilla, but does want a bottle of your own blood purifier, and purchases accordingly. Are you to be called a substitutor for a transaction like that? In both instances these people left their respective homes with their minds fully made up as to what they wanted, and you induced them to take something else instead. The two cases are exactly alike. No one would say you were a substitutor for inducing a man to buy a bottle of citrate of magnesia when he intended only to buy five cents worth of Epsom salt. But the manufacturer of X's sarsaparilla would say you are a base substitutor for not handing over a bottle of X's sarsaparilla when it was called for. The manufacturer probably spent considerable money in inducing the lady to call for a bottle of his sarsaparilla, and demands as his right that the lady should have been given a bottle of his preparation without question. He created the demand and should have had the benefit of it. He takes the view that the lady is his customer and not yours, and that you are simply his agent. Here is where we would differ from the manufacturer.

The lady is his customer until she puts foot into your store, but after that she is your customer, and you are bound to take good care of all of your customers. Treat them in such a manner that they will be pleased, and after leaving your store they will speak well of you to others.

If one of your patrons comes in and asks for a certain proprietary article and you manufacture a preparation which you are honestly convinced is a much better article, you would not be doing him justice if you did not tell him about the superior merits of your own preparation. It is your plain duty as a pharmacist to do so.

What should be the character of a preparation which the pharmacist may offer in the place of a proprietary article? It should be a good and honest preparation, one that has real merit, one that he would not hesitate to use in his own family. He should put it up himself, and let neither the name nor the style of package bear any resemblance whatever to the preparation it is intended to displace. I think it is a mistake to offer as your own preparation something that has been put up by some one else. It is still a greater mistake to put up your own preparation and use the name or style of package resembling some proprietary article. Be original, put

up a good honest preparation in an honest package, and do not be timid about stating its merits. Do not hesitate to recommend any preparations which you put up yourself to take the place of proprietary preparations. Recommend them as being the most satisfactory preparations you have in your establishment.

Another mistake which a beginner is apt to make is to spring a whole line of his own preparations at one time. Begin slowly at first and then gradually spread out. A cough syrup is the easiest one to begin with. It will show what your possibilities are and give you the necessary confidence to venture at something else. After you have your cough syrup started, it will be an easy matter to bring out a liniment or a pill, and later on a blood purifier or a tonic. Other preparations will readily suggest themselves to the pharmacist who is alert, and in the course of a few years you will have a line of preparations which you can truly say are your own, and which besides yielding you a handsome profit, will increase your reputation as a pharmacist.

It is not my purpose here to offer any formulas, but I have no hesitation in saying that the average pharmacist can manufacture not only as good, but a better preparation than is contained in the average proprietary medicine now offered to the public. He has it in his power, if he cares to exercise it, to almost completely destroy the sale of any proprietary medicine, no matter how extensively advertised, so that where formerly a dozen bottles were sold, only one or two will be sold. I am not making too bold a statement here, because specific instances can be cited where this has been done and is being done every day to an increased extent.

There are some who hesitate about putting up a line of their own preparations on account of the expense, thinking that it will require the purchase of odd-shaped bottles, cartons and wrappers. Cartons and odd-shaped bottles are not necessary, in fact they are in some instances undesirable. About the only extra expense necessary is for labels and is scarcely worth noticing. Select a neat label, and for your liquid preparations use unlettered prescription bottles, which you always carry in stock. This will give you another good weapon to use against proprietary preparations. You can point out the deception which the manufacturers practice with their thick glass and deeply-paneled bottles as against your preparation put up in an honest bottle. You can truthfully say that a concern that practices such deception can justly be suspected as to the truthfulness of their statements on their label and in their advertisements. Above all other things, never offer any of your own preparations at a cut price. If Mrs. Jones comes into your store and wants a bottle of your own blood purifier, it will cost Mrs. Jones one dollar. If she wants a bottle of X's sarsaparilla, she can have it at a cut price. Impress it upon her that if she buys a bottle of your own blood purifier she can rest assured that she will be getting full value for her dollar. You are compelled to charge one

dollar for your preparation because the ingredients entering into its composition are expensive and it requires skill and care in its compounding. Arguments along this line generally effect a sale, and should any of your own preparations be returned to you as unsatisfactory, the price paid for them should be politely returned without any argument whatever, and charged to the advertising account. This will not occur as often as you might imagine, and will not average over five per cent.

Do not say that your preparation is just as good, but say with conviction that it is a better preparation, which in fact it is.

To the pharmacist who makes a line of his own preparations and uses tact and judgment in their disposal, the patent medicine evil is not a very serious problem. What I mean by originality in style of package can be better understood by examining the samples herewith submitted.

THE CHAIRMAN: Is there any discussion on the paper just read?

MR. BUTLER: I am one of the old-fashioned druggists, and when a man comes into my store and asks for Ayer's Sarsaparilla I think it is my business to give it to him. The pharmacist may claim that his preparation is better, but he does not know what is in the majority of the patent medicines, and I don't see how he can say that. I think it doubtful if the Association should endorse that view.

The chair stated that if there was no further discussion the paper would take the usual course, and it was so ordered.

The following paper by Mr. Eberle, of Texas, was read by title and referred to the Publication Committee:

OBSERVATIONS AND NOTES ANENT THE DRUG BUSINESS.

BY E. G. EBERLE, DALLAS, TEXAS.

I was requested by the Chairman of this Section to write an article upon the relationship which should exist between the retail and wholesale druggist. Some mental and gathered notes induced me to deviate somewhat from complying entirely with the request, but I have interspersed my notes and observations along this line with some more especially connected with the retail drug business.

There are in the United States and Canada upwards of 42,000 retail druggists, nearly 500 jobbing houses, and about 7,000 manufacturing establishments that sell all or part of their wares to the two former.

In 1901 there were forty-three failures among the manufacturers, with liabilities footing up something over one and a half millions, or an average of about thirty-six thousand dollars. During the same year there were 330 failures in the other two cases, with liabilities amounting to not quite one and one-fourth millions, or an average of thirty-six hundred dollars. During the first six months of this year there have been thirty-two failures in the former and one hundred and seventy-seven in the latter, with liabilities among the manufacturers of less than one half million, or an average of

fifteen thousand dollars against about three-fourths million or an average of something less than forty-five hundred dollars for the latter classes. Counting backwards from 1901 to 1898, the number of failures among the manufacturers for the first six months of each year run as follows: 29, 19, 21, and 44; for the latter six months of the same years: 14, 23, 17, and 22; an average of about 28 failures for the first six months of the year against an average of about 21 for the other six. The liabilities ranged, using the same plan for comparison, first six months, \$1,334,378, \$375,953, \$602,353, \$2,472,879; last six months, \$206,107, \$251,915, \$500,944, \$360,477. Taking up the other two classes, we have for the first six months of the same years, 176, 131, 149, and 240 failures, or an average of 174 against 85, 199, 287, and 277 for the latter half of the same years, or an average of 212. The liabilities for the first six months of same years: \$639,667, \$612,953, \$837,941, \$1,035,389; last six months, \$580,836, \$728,390, \$102,004, \$791,370. Taking an average of the four years in each of the classes, we have about one and one-half millions per year charged up to each, the latter exceeding the former by several thousand dollars. The deductions are what we would reasonably expect, the success or failure of the one affects the other, the failures of the one class precede the other, or *vice versa*, for the reason that the failures of one class affect the other, failures may be more numerous in a year of prosperity because in the year of adversity preceding, the dependent class has injuriously affected the other. You will note that the number of failures and attending liabilities of the one class are the reverse of the other as to time and amount.

The manufacturer is constantly endeavoring to get nearer to the retailer, that is, dispose of his wares to him without the aid of the jobber, for reasons easily discernible.

I believe it will hardly be gainsaid after mature reflection, that the wholesale druggist is a necessity. It is a matter of impossibility in a business of so much detail, such a variety of stock, for a retailer to carry all the items needed in the general routine of his business, while the jobber, supplying goods in various parts of the country, can and does carry these lines. He, in fact, carries the stock of the retailer, making it possible for him to transact business on a smaller capital than he otherwise could. The jobber makes his profit out of the retailer, but in return carries a variety of stock for the latter that he could not afford to have otherwise; the retailer, therefore, is enabled to do business on the jobber's investment, and thus make a profit he would have had to dispense with. In other words, these two divisions work hand in hand, and are beneficial to each other, and the one should endeavor to enhance the interests of the other.

Does the retailer always achieve benefit by being brought closer to the manufacturer? In order to buy of the manufacturer to any further advantage than can be had of the wholesaler, a large amount of goods must be bought. Idle capital or stock, which is to all intents and purposes the

same, does not make money. For instance, if you have bought five hundred dollars' worth of goods, and at the end of the year have half of them left, even though you have received an extra ten per cent., you have gained nothing, besides having on hand goods that have become aged and more or less damaged, and you carrying all the risk yourself. No explanation is necessary of the fact that the oftener a stock is turned the more money is made, but it is a point not always observed. The above observation is based upon the presumption that the retailer retains all the purchased goods himself. Frequently, in order to buy jobbing quantities two or three retailers club together and divide. Under these conditions, while all of them may have gained equally, no one of them has received advantage over the other; they are simply competitors on the same goods bought at the same price, and it still remaining true, that more than likely, goods that will be idle stock have been purchased. The wholesaler has been antagonized by causing him to lose the profit he otherwise would have had, the manufacturer has received no more profit than he would have had from the jobber.

Sampling of pharmaceuticals is carried to an unwarranted excess. Frequently the value of pharmaceutical specialties in a locality exceeds the amount that will be sold at a profit for the manufacturer during several years. The samples handed out to the physician are constantly becoming larger, leading him to dispense at no cost to himself, and frequently placing the samples in the hands of the consumer, who is led thereby to self-medication.

The analysis of the above remarks develops these facts: The manufacturer loses if the doctor and druggist use the samples instead of prescribing or purchasing stock; he gains if the physician continues to prescribe and the consumer practices self-medication. The druggist loses by having to fill prescriptions composed of an article that requires no further skill than the feat of pouring the same into another bottle, or labeling the original, and which bears only a profit usual on ordinary merchandise, and also if he is necessitated to buy stock which falls into disuse ere the purchased amount is disposed of. The jobber loses through goods being shipped direct; the physician by instructing his patients how to dose themselves.

There was a time in the history of the patent medicine business when it was only necessary for the manufacturer to advertise or sample, and then go into the retail stores and sell, causing them to overload with goods on which the demand ceased with the advertisements, or even sooner. This condition has fortunately improved, and the placing of a patent medicine on the market, except perhaps locally, is a matter of more effort and expense. It is hardly necessary to point out the injurious effect of such overstocking; it leads to the disposal of remnant stock at a greater discount than the previous profit made amounts to, not considering the time

and expense required in disposing of these wares. There is still another point : the druggist burdened himself with a debt, in which the jobber did not share the profit, and usually he is required to extend time on goods purchased of him on account of it.

The application of direct purchase applies with equal force here as for pharmaceuticals, if not more so. The jobber carries, along with what may be termed staple patents, such that the retailer could not afford to carry on account of limited demand, and under these circumstances becomes only a convenience. Again, let a dealer purchase in large quantities direct there is more or less of a temptation to cut and get the advantage of the other fellow. The purchaser of these quantities is seemingly better fixed for cutting than the one who buys in less quantity ; the result as we well know is a diminishing of profits on the one hand, a threatened if not actual failure on the other. The large purchase has done more harm than good, and in no event has it added a benefit ; it has taken away from the jobber a profit he otherwise would have had, and probably by the unsuccessful venture of the retail dealer has also had inflicted upon him another loss pursuant upon failure. In many instances the quantity purchased may be all right, and I would indeed hesitate to recommend that the retailer shall circumscribe his business ; but as I firmly believe, that if the facts are carefully weighed relative to an overstocking, of idle stock, of an investment in excess of the financial means, in other words a speculation, that the instances where it is really advantageous to withdraw support from a local jobbing house to gain a seeming or possibly an actual advantage, will be cut down considerably. It does more : the purchase of quantity demands that in order to dispose of the goods they must be pushed and frequently to the disadvantage of more profitable ones ; therefore, while the retailer may consider that he has saved money, he forgets that he may have advanced the interests of a patent medicine, the proprietors of which cry substitution and advertise the cry in letters of the deepest black upon the whitest back-ground. In other words, the retailer supplies the ammunition and then spends talk, time and money in an almost fruitless endeavor to destroy the force of his own production. He expects the wholesaler, whom he has deprived of a legitimate profit, to help him, because he has bought those goods of him, he could ill afford to buy elsewhere.

The wholesaler, if for no other purpose than the furthering of his own interests, is ever ready to work in conjunction with the retailer, provided his efforts are reciprocated, but he can not be enthusiastic, if he is only patronized through sheer necessity. That he can aid the latter in upholding prices, I can freely vouch for through experience ; yea more, I can refer to instances where the cutting prevailed to an extreme, in a city of no small size, that full prices were re-established through the co-operation of the local jobbers. To achieve such results there must be a degree of

harmony among the retailers, and they must stand by the jobbers, supporting them within reasonable bounds, make them your friends by being a friend to them. There can seldom be an excuse for contrary action, the local competition even will force them to supply the quality and kind of goods you demand. That is the keynote of a successful venture, the evidences of results exist and you have the opportunity of looking at this picture and then at that. I do not mean to say that a few months or even a year will bring about the results, in the larger cities maybe never, but it will improve matters to a certainty and achieve success in many instances.

Crude drugs are constantly decreasing in demand by the druggist, which implies that the manufactured article is replacing the former. Here the manufacturer has gained, the retailer has lost.

The druggist is charged with being a poor business man, and while this condition is largely exaggerated, it is to an extent true. Let us endeavor to assign reasons for the causes that permit of such accusation. The vocation of the druggist cannot be compared with any other business or profession, it possesses the attributes of both, and of a variety of the divisions that constitute them, he is in a class by himself. Long hours, close confinement, care and accuracy in details, and the qualities of a bureau of information, are among the prerequisites of the calling. It is foreign to his profession as such, to give much thought to such an insignificant feature as finances; if he is merely a merchant, then he has no profession. Among the latter we have those who have entered the business because they were imbued with the belief that the profits in the drug business were phenomenal, without giving the matter of volume of sales any consideration. They enter a business which they know little or nothing of, because the capital required is small, without any conception of what the sales will probably be in the chosen locality, nor even a correct idea of the gross profits, let alone the consideration of the fact that the expenses of a drug store are proportionately larger than those of other lines. They would not attempt to enter any other business with such a deficiency of knowledge, yet they step into the most professional of all mercantile lines, that requires unusual care and fitness for it, with a conviction that their fortune is made. They think the large profits will offset mistakes of ignorance.

It is no unusual occurrence that one of these, and even of the other class, after several years of business experience, does not actually know what his monthly or yearly sales foot up, what his expenses are, what his indebtedness is, or his stock invoices.

Let us now consider points that may contribute to improvement and view incidentally why some of the conditions described above exist. The colleges of pharmacy having a commercial course have taken a step to improve commercial qualifications. Whether this was a proper step for them to take may be questioned from the standpoint that such information and knowledge should be sought elsewhere, but that argument is

not my purpose in this paper. That such training is beneficial for the advancement of the commercial side of the drug business is beyond question, but the possibility reaches only that small portion who attend colleges of pharmacy.

The pharmaceutical journals have here an opportunity to improve the conditions and their efforts would be worthily spent. I recognize the fact that some of them have done so, and perhaps have not had assurances that their efforts were appreciated or of benefit ; still I wish to say, whether they are appreciated or not, they are benefiting the cause. I believe that if all journals, except those that deal entirely with scientific matter, would adopt practically the same lines and articles in detail for this department, give them prominence editorially and otherwise and keep hammering, good results will follow. There are those who though not over much supplied with intelligence, read journals, at least while some one is looking, if for no other reason than to be considered somewhat superior because of reading them. In looking over the papers they will, even if unawares, absorb to some extent what is printed. Others want to learn and pursue the reading with that end in view.

Now for some of the points that should be made conspicuous. First, and above all, the druggist should be impressed with the fact that a man should be fitted for the business by education and experience. This will take a long time—sometimes life is too short. He must be impressed with the fact, which he discovers frequently too late, that he must not expect to sell in volume or value as much drugs as groceries, consequently he should buy in small quantities and oftener, because with the goods in his house he carries the risk, they are subject to deterioration, damage, disuse. He should exact a profit proportionate with the sales or what has been deemed reasonable profit by experience of others. He cannot make a run on certain classes of medicines, as can the clothier or dry goods merchant. He must not over-estimate his profits and thereby obtain his consent to do a reckless credit business, excusing himself, through the illusion, for having so much on his books, by saying, "most of it is for prescriptions and consequently nearly all profit." It is the aggregate of profits that furnishes a livelihood, and if that is destroyed by such acts, it inflicts financial injury. If you forget to charge an article that has cost you one dollar and you supposedly sold for one dollar and fifty cents, you will have to sell six dollars' worth of goods at same profit before your stock is of same value as at the time you committed the error, not considering the time and expense involved, nor the effects of the bad habit you have started or encouraged. I spoke to a newsboy, who was drinking a ten-cent glass of soda : "My boy, how many papers will you have to sell before you are even?" "Two," he said ; and I have known persons in the drug business who figured just that way, not for a moment considering their diminished stock. He should be made to recognize that the expenses of conducting

a drug store are proportionately greater than many other lines : first of all his store has a large fixture item compared with his stock, this is expense but usually a good investment ; then there are incidentals that the public expects gratis of a druggist, aside from the usual running expenses.

The druggist's books should be kept so as to show the condition of his business day by day, which can easily be done by having properly kept merchandise and expense accounts. He should do more than this : his stock is easily separated into divisions, part of which are usually denominated side lines, for instance, the soda fountain, cigar stand, etc. Each of these divisions should either show a profit upon its own merits, or be brought to this point, and if impossible to accomplish this, then it is an injury to the business, unless it can be shown that it sufficiently enhances other lines, and thereby makes up for the expense and time involved in its sustenance : otherwise it should be discarded. This work is easily accomplished by means of a cash register, but can be as effectively achieved by means of checks or tickets. A prescription record is a ready method to use in this department, and against it should be charged, as in the above, a proportionate expense, more especially that which strictly accrues to the department. Deducting the expense, profits, etc., from the several totals, we have the indications for the remaining part of the stock. If the larger houses can successfully, and in fact are of necessity required to keep such record, the retailer or smaller dealer can do it as well, thereby placing himself in position to have an intelligent idea of how and why his business is progressing or retrograding. The drug business requires that the votary should be endowed with qualifications almost opposed to each other ; he must be able to solve all scientific as well as business problems, and avoid chemical as well as financial incompatibilities. The druggist should not be so completely absorbed in the science of pharmacy that he will forget or neglect the financial condition of his business, nor so devoted to the mercantile side or the almighty dollar as to forget the fact that his profession places upon him moral as well as legal obligations, which he is in honor and duty bound to observe and discharge.

Nominations of officers of the Section being now in order, Mr. Anderson attempted to nominate Mr. Mittelbach, of Missouri, for Chairman, but that gentleman asked that his name be withdrawn ; whereupon Mr. Whelpley nominated Mr. Thos. V. Wooten, of Chicago, for that position. Mr. Searby moved that nominations for Chairman be closed and that Mr. Wooten be elected by acclamation, and this was done.

Mr. Mayo nominated Mr. W. C. Anderson, of New York, for Secretary, and Mr. Rapelye moved that the present Secretary of the Section cast the affirmative ballot of the Section for this gentleman, and the motion prevailed. The Secretary announced that he had cast the ballot as directed, and the Chair declared Mr. Anderson elected Secretary for the ensuing year.

For associate members of the Committee Mr. Whelpley nominated Mr. W. A. Frost, of St. Paul; Mr. Rapelye nominated Mr. J. K. Williams, of Hartford, Conn., and Mr. Whelpley nominated Mr. C. C. May, of St. Louis. Mr. Rapelye moved that nominations be closed, and that the Secretary cast the ballot of the Section for these gentlemen as associate members of the Committee. The motion prevailed, and the Chairman declared them duly elected for the ensuing year.

Upon motion of Mr. Mayo, the reading of the minutes was dispensed with.

Mr. Rapelye and Mr. Mayo were appointed to escort the newly-elected officers of the Section to the platform, and brought these gentlemen forward.

THE RETIRING CHAIRMAN: I have the pleasure of introducing to you, gentlemen, your Chairman for the ensuing year, Mr. T. V. Wooten, of Chicago. [Applause.] Also your Secretary, Mr. W. C. Anderson, whom you all know. [Applause.] Likewise two of the associate members of the Committee, Mr. J. K. Williams, of Hartford, Conn., and Mr. W. A. Frost, of St. Paul. The other gentleman is not in. I am sure the Commercial Section the succeeding year will show a vast amount of improvement.

Mr. Wooten then took the chair and said:

Gentlemen, this is not the time to make a speech, but I want to say that any retail pharmacist who loves his calling would feel honored by being elected Chairman of the Commercial Section, and I assure you I esteem it a very high honor. I shall do the best I can to make this Section what it deserves to be, an aid to the retail druggists of the country and the members of the Association, and to all who deserve to profit by the success of the drug business. [Applause.]

There being no further business before the Section, on motion of Mr. Mayo, it then adjourned.

MINUTES

OF THE

SECTION ON SCIENTIFIC PAPERS.

FIRST SESSION.—WEDNESDAY EVENING, SEPT. 10, 1902.

The Section was called to order at 8:10 p. m. by Chairman Lyman F. Kebler, in Horticultural Hall, Broad Street.

The Chairman announced the enforced absence of the committee's associate member, Mr. Albert Schneider, whereupon Mr. Kremers put in nomination to fill his place Mr. J. O. Schlotterbeck, of Ann Arbor. Mr. Eccles seconded the nomination, and Mr. Schlotterbeck was duly elected to serve as associate member of the committee during this meeting.

Mr. Schlotterbeck was called to the chair while the Chairman's Address was being presented by that officer:

CHAIRMAN'S ADDRESS.

Members and Friends of the Scientific Section: As Chairman of the Scientific Section, it becomes the speaker's duty and privilege to address you upon subjects of interest to this Section. Inasmuch as this meeting is to contain something of the historical element, is held in the City of Brotherly Love, and the Chairman's energies are directed mainly along the various branches of chemistry and pharmacopœial problems, he has chosen to talk to you on some of these subjects.

CHEMICAL PROGRESS. Advancements in chemistry are in many instances synonymous with progress in pharmacy. During the past few years many notable achievements in chemistry have been made; but in the short time allotted the speaker, it will be possible only to take up a few of the more interesting, which are indications as to the spirit of our times.

SULPHURIC ACID BY THE CONTACT PROCESS.

The quantity of sulphuric acid manufactured by a country is an index as to its prosperity. In 1870,* there were about twenty-five sulphuric acid plants in active operation in this country, with an annual output of a little over a million dollars' worth of acid. In 1890, there were one hundred and five establishments, with an output of 1,384,776,962 pounds, valued at \$7,679,473; while in 1900, there were in active operation one hundred and twenty-seven sulphuric acid plants, with an output of 2,695,460,489 pounds, valued at \$14,247,185.* The increase between 1890 and 1900 is certainly very marked, being nearly doubled in value.

*Twelfth Census, U. S. Bulletin No. 210, page 8, 1902.

As early as 1793, Mr. John Harrison, of Philadelphia, produced 300 carboys of sulphuric acid per annum, and it appears that he was not only the first manufacturer of sulphuric acid in this country, but also the first to use a platinum still (weighing 700 ounces) for distilling the acid. Powers and Weightman began to manufacture sulphuric acid in 1825, and Nicholas Lennig, about 1829, began its manufacture with such successful results that the company went into liquidation and with the funds started the well-known Chemical National Bank.

All of the sulphuric acid manufactured, until very recently, was produced by the well-known lead-chamber process; but it had been experimentally shown that the acid could be made by what is known as the contact process*. As early as 1831, Phillips discovered that sulphur trioxide could be produced by bringing together suitable quantities of sulphur dioxide and oxygen in the presence of platinum, and took out an English patent for this process in 1832. In 1848, Schneider exhibited a working model which produced sulphuric acid by means of pumice-stone as a catalytic agent. Richard Laming used pumice-stone impregnated with manganese dioxide as a contact agent, and in 1846, Jullion took out an English patent for platinized asbestos as a catalytic agent. Various contact agents were employed from time to time, such as sand, oxides of iron, copper, chromium, ferruginous and argillaceous earth. In 1875, C. Winkler published his celebrated researches along this line, upon the formation of sulphuric anhydride, for which industrial chemistry will always be highly indebted to him. His line of research was chiefly followed up by others and it was shown, in many instances, that with pure material almost theoretical quantities of sulphur trioxide could be produced. The catalytic agents, under these conditions, did not seem to diminish appreciably in efficiency. From these results, it was supposed that the problem of making sulphuric acid by the contact process had been solved, and accordingly arrangements were made to produce it on a large scale. It was soon found, however, that the contact substance always diminished in efficiency, no matter how efficiently the gases seemed to have been purified. It was, therefore, necessary to again make farther experiments, so as to ascertain where the difficulty was. These experiments were very laborious, long, costly and distressingly disappointing; but perseverance triumphed, and it was ultimately found that minute quantities of such bodies as antimony, bismuth, lead, iron, zinc and the ubiquitous arsenic, concerning which the writer will speak in another paper, were constantly present in the gases employed in the manufacture of sulphur trioxide, and these bodies acted very deleteriously on the catalytic agents—the arsenic being by far the most injurious, some of which was traced as coming from the iron tubes which were used in the apparatus. As a preliminary step toward the removal of the above elements, it was found absolutely necessary to cool the gases slowly, and finally, after much washing and extended filtration in a suitable apparatus, the gases were obtained in an absolutely pure condition.

The manufacture of sulphur trioxide being now successfully established, the next important element was the effective and economical utilization of the exothermic heat, so as to make the contact process eminently satisfactory. It was the universal belief that extra heat was necessary, with the weaker roaster gases, and accordingly an apparatus was installed with special heating arrangements, but the surprising discovery was soon made that the output of acid was much increased and the gas current could be made greater, if instead of heating artificially, the apparatus was systematically cooled. The conversion begins at 200 degrees C., is most efficient at about 400 degrees C.; and higher temperatures are detrimental, for at 700 degrees C. the efficiency is only 70 per cent., and at 900 degrees C. the reaction almost ceases. The yield of sulphuric acid by the contact process is from 96 to 98 per cent. of the theoretical.

It was also considered essential to work with compressed gases so as to overcome the

* Abstract from R. Knietsch's paper in *Ber. d. Deutsche Chem. Ges.*, 1901, page 4069.

interfering action of the indifferent gases present, but practice showed that the yield was almost quantitative at the normal atmospheric pressure.

Several discoveries in the successful working out of the contact process show clearly how theoretical considerations may lead us astray, and rational working methods are frequently developed which are the reverse of what is considered good practice. That the process has passed the experimental stage is shown by the fact that in 1900, 118,000 tons of sulphuric acid were made by it; and it is hoped that the method will be speedily adopted in this country.

The managers and chemists of the Badische Anilin und Soda Fabrik certainly deserve to be complimented for the indefatigable perseverance shown in successfully working out the contact process.

SYNTHETIC CAMPHOR.

Camphor is an article in which every pharmacist is interested, especially in view of the fact that within recent years the output of camphor has been completely in the control of the Japanese government, and prices have been abnormally high. The information of the successful manufacture of an artificial camphor which appears in many ways to be practically the equivalent of the natural product, must therefore be welcome news.

On April 29, 1902, there was granted to Nathaniel Thurlow a United States patent, No. 698,761, for the manufacture of synthetic camphor. The process of producing artificial camphor is based on the interaction of anhydrous turpentine and anhydrous oxalic acid at a suitable temperature. The resulting products consist chiefly of camphor and borneol. By treating the mixture with lime, and subsequently submitting the same to distillation, the borneol and camphor are separated. By oxidation the borneol is converted into camphor.

Article No. 5 of the patent reads as follows: "The compound, pinylformate, resulting from the action of oxalic acid on turpentine and having a boiling point at six hundred and eighty millimeters vacuum of 160° to 163° centigrade, solidifying below -17° centigrade, decomposed on heating into borneol carbon monoxide, and decomposed on heating with caustic alkali solution into hydrocarbons and a formate."

The sample before you on investigation gave the following results: Physical appearance, odor, taste and solubility all like the natural product. On exposing the natural and artificial products to the atmosphere side by side it was noticed that the former evaporated from a perfectly transparent residue, while the latter left an opaque or effloresced residue. Melting point, 172° C. (uncor.); boiling point, 204° C. (uncor.); optical rotation in a 10 per cent. alcoholic solution at 25° C., plus 3.64° ; specific gravity at 15° C., 0.993. The corresponding constants of the natural product under the same conditions were as follows: Melting point, 175° C. (uncor.); optical rotation plus 47.22° ; boiling point, 204° C. (uncor.); specific gravity at 15° C., 0.995.

From the above data it can readily be seen that the two articles resemble each other closely. The only marked deviation is the optical rotation, which serves as an excellent point to differentiate between the artificial and the natural products. Synthetic chemical compounds are generally inactive unless they are derived from optically active bodies. It appears that in synthetic chemistry there are introduced either two asymmetric carbon atoms which neutralize each other optically, or one is in preponderance, or there is none introduced. In this product there is some optical rotation; consequently we must conclude that there is some part of the camphor which contains an asymmetric atom; or there are several asymmetric carbon atoms, with a preponderance of one.

CARBON BISULPHIDE BY ELECTRICITY.

Because of the disagreeable features connected with the manufacture of carbon bisulphide, no less than six different parties have ceased to make it during the past few years; and as one operator expresses himself, he would have done so himself but he "was un-

able to let go," therefore he set himself to the task of developing a better process. At this he worked a number of years. The process ultimately devised proved so clean and so pleasant that it far exceeded the fondest hopes that he had ever pictured. For this process Mr. E. R. Taylor procured a patent in the United States, June 10th, 1901, No. 702,117.

The furnace is of the vertical type and the tower is surrounded by a brick shell, the annular space between it and the tower being utilized for the purpose of warming and melting the sulphur by the furnace heat on its way to the electrodes, which are situated at the bottom of the furnace. The top of the tower of the furnace is so constructed that the carbon bisulphide gas can be conducted away into condensers, and the carbonaceous matter can be introduced.

The substance of the patent, briefly stated, is as follows: in the continuous production of carbon bisulphide, in an electric furnace, the method consists in melting the sulphur on its way to the working chamber, there feeding the same upwardly to the heated zone and vaporizing it, feeding the carbon downwardly upon the melted sulphur, and passing a suitable electric current through the charge, at the junction of the carbon and the melted sulphur, to effect the heating.

The process of Mr. Taylor has practically revolutionized the manufacture of carbon bisulphide in the world. By his method carbon bisulphide can be made continuously, with interruptions only for necessary repairs and possibly intervals for suitably cleaning the apparatus of inorganic material that might accumulate so as to interfere with the proper working of the apparatus. See also cuts and outline of method in 1902, Trans. Am. Electrochem. Soc. 1, page 115.

METALLIC SODIUM AND NITRIC ACID BY ELECTRICITY.

In 1889, Mr. Darling* conceived the idea of manufacturing metallic sodium from sodium nitrate, by electricity; but how to separate such an easily oxidizable substance as metallic sodium from such powerful oxidizing agents as sodium nitrate and the decomposition products of the same appeared insurmountable. After much experimental work at Harrison Brothers, of Philadelphia, the first form of furnace or electrolytic† cell was erected in 1901, capable of decomposing from 700 to 800 pounds of sodium nitrate per day. This apparatus proved only partially successful; but it clearly showed that the liberated ions must be so separated from each other as to allow absolutely no opportunity for recombination. For this an efficient porous diaphragm was necessary, but what substance or mixture could be found to withstand the action of such powerful agents as melted sodium and the nascent gases arising from the electrical decomposition of the sodium nitrate? A long series of disappointing experiments were made, including many bodies, and at last it was found that granular vitrified magnesium oxide was the most suitable. A successful furnace‡ was constructed which consisted of a porous cup eight inches internal diameter, 26 inches deep, with walls four inches thick, consisting of perforated steel shells filled and tightly rammed with a fused, granular, vitreous magnesium oxide, which was in time§ replaced by a mixture of dead-burned magnesite and Portland cement. The porous cup was set in a cast-iron pot, 22 inches internal diameter, filled at the bottom with six inches of refractive material. The three-inch space around the porous cup was filled with sodium nitrate and the inside of the cup itself was filled with sodium hydroxide. The cast-iron pot served not only to hold the sodium nitrate, but also acted as the positive electrode. The cathode or negative electrode was

* 1902, Jour. Franklin Inst., 153, 65.

† 1894, U. S. Pat., No. 517,001, March 20th.

‡ 1897, U. S. Pat., No. 590,826, Sept. 28th.

§ 1901, U. S. Pat. No. 641,376, Jan. 19th.

suspended, by means of wrought-iron pipes, in the porous cup, reaching nearly to the bottom. When external heat is applied the electrolytes melt, permeate the walls of the cup, thus completing the circuit when the electric current is turned on.

The action of the electric current is to decompose the sodium nitrate into metallic sodium, nitrogen dioxide, and oxygen. The gases are liberated at the positive electrode, and escape in an opening through the cover, from whence they are led away by means of earthenware tubes into a series of connected Woulf bottles containing water, with which the nitrogen dioxide combines to form nitric acid, according to the following equation: $3\text{NO}_2 + \text{H}_2\text{O} = 2\text{HNO}_3 + \text{NO}$. The liberated nitrogen monoxide takes up oxygen to form nitrogen dioxide, which in turn unites with water to form nitric acid.

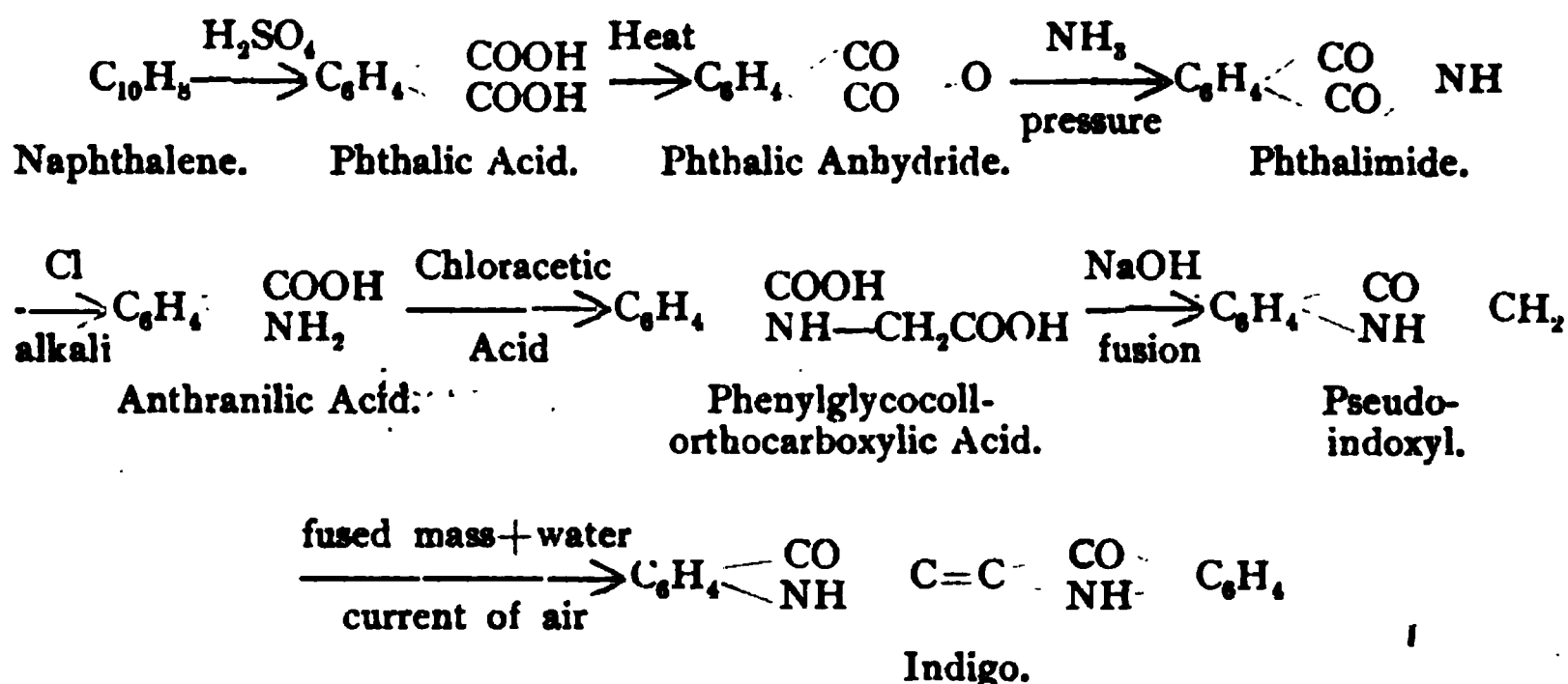
The positive sodium ion passes through the porous cup into the molten sodium hydroxide to be ultimately liberated at the cathode as metallic sodium. At first the sodium hydroxide absorbs or combines with metallic sodium, the hydrogen being evolved; after some time, however, the fused metallic sodium rises to the top of the sodium hydroxide electrolyte, from whence it can be removed at intervals. Several* improvements have been made upon the above apparatus since it has been in active operation on a large scale. Experiments are at present being made to find an outlet for the metallic sodium which appears to be a "drug on the market."

ARTIFICIAL VS. NATURAL INDIGO.

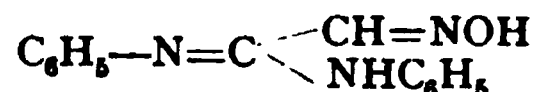
For a number of years it has been a neck-to-neck struggle as to which of the above articles would hold supremacy. It was thought for a time that the artificial would certainly outstrip the natural in a short time after it was discovered that toluene could be made the starting point, but it soon developed that there was not enough toluene available for this purpose, unless it was made especially, and this could only be done at an increased expense. At present the natural seems to be looked on with considerable favor, in that much energy is being directed towards the proper methods of cultivation and scientific preparation of the indigo from the plant.

Two interesting synthetic methods, however, have come forward, prominently, within the last few years, and it is to these that the chairman wishes to briefly direct attention. From naphthalene, as a crude product, phthalic acid is prepared by dissolving the naphthalene in fuming sulphuric acid and distilling the mixture in the presence of mercury. (The influence of the mercury in the above mixture was discovered by the accidental breaking of a mercurial thermometer in the course of some investigations.) After it was discovered that naphthalene could be made the starting point in the manufacture of indigo it was thought everything was plain sailing, but it was soon found that there were at least three obstacles. The first was the manufacture of ample fuming sulphuric acid for this work. This has been solved by the contact process, by which any quantity of the above acid can be made at a minimum cost. The second was an enormous quantity of concentrated chlorine; a want that is satisfied by Griesheim's electrolytic process; the chlorine being subsequently purified by liquefaction. The third difficulty is the limited supply of naphthalene. It was soon found that after the naphthalene process was put into operation the supply of this article was not adequate for the demand, and for the present this problem has not been solved, consequently the method is practically at a stand-still. One important item in this connection should be mentioned, and that is the recovery of from 25,000 to 40,000 tons of sulphur dioxide produced annually by the oxidation of naphthalene in the form of sulphur trioxide, by C. Winkler's contact process, spoken of above. The different steps in the naphthalene process are indicated by the following consecutive constitutional formula:

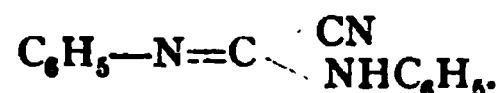
* 1901, U. S. Pat., No. 641,438, Jan. 16th.



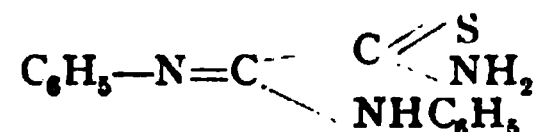
From the present outlook the extraordinary Sandmeyer method may turn out to be a more dangerous rival to natural indigo than the naphthalene process. Sandmeyer discovered that when aniline is treated with chloral and hydroxylamine an oxime having the following constitution is formed:



which, when treated with sulphuric acid at 90° C. gave *α*-anilide of isatine. He soon, however, found that the above expensive oxime could be replaced by the corresponding nitrile, Laubenheimer's* hydrocyanicarbodiphenylide, which has the following constitution:



On treating this compound with ammonium sulphide a thioamide is formed, having the following constitution:



from which, when treated with concentrated sulphuric acid at 90° C., *α*-isatanilide is produced. *α*-Isatanilide is readily converted into isatine by dilute acids or into indigo by ammonium sulphide.

In this process there are used, besides aniline, carbon bisulphide (now made almost for nothing by the electrical process spoken of above), spirits, white lead, ammonium sulphide, sulphuric acid, and potassium cyanide. The potassium cyanide is the only expensive item in the process, and if a method could be invented to produce it more cheaply the process would stand a great chance of success. As it is, the patentees appear to have great confidence in it, judging from the amount of money invested in material and apparatus.

We can see no reason why sodium cyanide cannot be used instead of potassium cyanide, and as stated above, the metallic sodium produced electrolytically from sodium nitrate appears to be a "drug on the market." With an abundance of cheap metallic sodium which can readily be converted into sodium cyanide, it looks as if the aniline method would soon be master of the situation, for the reactions go on smoothly and the yields are very good.†

* 1889.

† 1880, Ber. d. Deutschen Chem. Ges., 13, 2155.

ARTIFICIAL SILK.

E. Fischer and Leuchs* have succeeded in artificially preparing serine, the principal hydrolytic product of sericine, which is the essential constituent of natural silk. It is made by the successive interactions of glycollic aldehyde, alcohol, ammonia and hydrocyanic acid; and treating the resulting nitrile with dilute hydrochloric acid. This synthesis is an exceedingly important one, as it goes far toward the successful preparation of silk artificially, without the intervention of animal life.

SYNTHETIC TARTARIC ACID.

A. Zinno† has succeeded in preparing tartaric acid artificially by passing carbon dioxide under above three atmospheres of pressure over potassium glycerate. The reactions involved resemble those of synthetic salicylic acid.

The above achievements clearly show that "success can only be hammered out on the anvil of perseverance."

PHARMACOPŒIAL PROBLEMS.

On the eve of the revision of the Pharmacopœia, when the revision committee is so actively engaged in its work, a few words concerning this standard would certainly not be out of place.

ATOMIC WEIGHTS.

The atomic weights have been a source of considerable anxiety among the various chemists of the world, and undoubtedly this same problem is confronting the present revision committee. There is a great division as to whether oxygen with its atomic weight of sixteen shall be adopted as the standard, or hydrogen with an atomic weight of one. There are two great schools at present, one favoring the hydrogen and the other favoring the oxygen. The hydrogen unit undoubtedly has its strong points, for all gases are referred to it in the determination of their densities. The physicist in particular is very much in favor of hydrogen as the unit, and he is supported to a large extent by a coterie of European chemical teachers. There are many objections to adopting hydrogen as the unit, especially in the class-room, for it is very seldom that in teaching we use the fractional portions of the atomic weights, choosing rather to use the whole number, and making the calculations much more simple and less repugnant to the pupil. If the teacher employs whole numbers, and the pupil finds different numbers in his books and on the charts, what will there be revolving in his mind? Explanations will of course be necessary. The oxygen standard would in a large measure do away with these fractional parts of the atomic weights and simplify matters very materially, especially from the point of view of remembering the atomic weights as whole numbers. Again, if oxygen is not adopted as the standard, many thousands of recalculations will be necessary, as there are many thousands of calculations in print based on oxygen as sixteen. In industrial and analytical chemistry it is certainly very cumbersome to be compelled to use one or more decimal figures in calculations, but this becomes absolutely necessary in some cases, if hydrogen is used as the unit, because there is generally considerable difference between the atomic weights obtained by using oxygen as sixteen or hydrogen as the unit. The employment of these different atomic weights causes marked discrepancies in results and money values. We all know money talks and will be heard. The speaker's preference is the oxygen standard, but in view of the fact that the 1890 Pharmacopœial Committee deemed it wise to base the atomic weight on the hydrogen unit, it seems to him that it would be unwise to change the basis at present, unless some new movement presents itself before the 1900 issue is ready for the press.

* 1902, Sitzungsber. Kgl. pr. Akad. Wiss., Berlin, 6, 78; from Chem. Central-Blatt, (5) 6, pt. 2, p. 762.

† 1902, Moniteur Scien., (4), 16, pt. 2, page 493.

CHEMICAL NAMES.

There are some rumors afloat that there will be introduced in the next issue of the Pharmacopœia some radical changes as to the chemical names and nomenclature. Some changes are necessary, and it is of course impossible to consult the whims of every one, but experience in the commercial world and other lines teaches the speaker that the creating of new names or radically changing existing pharmacopœial chemical terms will bring about considerable confusion, and in some cases mistakes.

ANALYTICAL METHODS.

During the last decade there have been material advancements made, by way of determining the active constituents of many plants and their preparations with a considerable degree of accuracy. At present there are so many methods for determining the various constituents in the host of plants, that the beginner, and even those who have had considerable experience in analytical processes, are in doubt as to which method should be employed. It appears as if the work at present is in such condition that there ought to come forward some genius to establish uniformity in assaying, to bring order out of chaos, if you please, as Berzelius did in chemical nomenclature, as Hofmann did in naming organic compounds, or as Wallach did in setting the investigations of volatile oils on a proper basis. Your Chairman is fully convinced that the various sporadic individual efforts will accomplish little by way of bringing about uniformity and the selection of the best methods for securing concordant results. We must have organized work. As long as such great discrepancies exist between the various analysts working on the same material, little sympathy or satisfaction can be expected, and we will have it thrown in our faces continually, by men of affairs, that analytical results are of little value from a commercial point of view. The writer does not wish to speak disparagingly on this point, because it is well known that other bodies have experienced similar difficulties in other lines of analytical work; for example, when the members of the Society of Official Agricultural Chemists undertook to establish uniformity, they found, on comparing notes, that their determinations of nitrogen (for which chemists think they have nearly perfect methods), in the same material, varied so much that they refused to publish them; and the Chairman is convinced that some of the results obtained by the various sub-committees of the Committee of Revision are so discordant that the committee would be very reluctant to publish them. He thinks, however, that such results ought to be published, even though they are discordant, because if it is known that they will be made public, greater care will be exercised, in many instances, in making the various determinations. He also thinks that the time allotted for some of the work is very inadequate. Your Chairman is fully convinced that the Sub-Committee on Proximate Assaying, for example, could do far better work if its allotted time extended over ten years, instead of crowding in such a mass of work in a few years, and the Chairman recommends that if the Pharmacopœial Committee sees its way clear to continue such a committee, that the committee be continued, map out a certain line of work for each year, and report the results of their work to some session of the Scientific Section of this Association. If, however, the Pharmacopœial Committee cannot comply with the above recommendation, it would be very desirable for this Section to take up the work as above outlined. The writer fully realizes that there will be many difficulties encountered, but let us remember that even so well-established a theoretical consideration as the benzene ring encounters difficulties even to this date, for it is well known that according to the results obtained by the heat of combustion, the carbon atoms possess nine single affinities, whereas, according to the work of Brühl on refraction, they possess three double bonds and three single bonds.

"STANDARDIZATION."

The tendency of the time is to standardize everything in sight. The writer himself is somewhat enthusiastic along this line, but he is of the opinion that we ought to go slowly

in this matter so that we will not be compelled to retrace our steps in a few years. The Committee of Revision ought to be relatively sure that the method appended to any substance or its preparations is comparatively simple and gives fairly concordant results. No method ought certainly to be introduced which will keep the analyst continually on the anxious bench lest some unpleasantness arise, because of the non-concordant results an unsatisfactory method frequently gives.

THE IPECAC PROBLEM.

The present edition of the Pharmacopœia virtually recognizes only the Rio ipecac. The Carthagena variety was well known at the time of the Revision, but practically it did not receive any recognition in the description of the drug, and since the publication of the 1890 Pharmacopœia, this variety has clamored very strenuously to gain admittance into this country—chiefly on account of the high price of the Rio. At first the Treasury Department would not permit its entrance into our ports; but after considerable negotiation and analytical work, the Department ruled that it could be admitted. Now there comes to our attention another ipecac, raised in India; it is called *Johore*, but is at present more successfully cultivated in Ceylon; consequently we are liable to have also a Ceylon ipecac. The ipecac cultivated in India is raised from the Rio roots, introduced from South America; and we have no good reason for thinking that the Carthagena comes from a different plant than the Rio. In view of these facts, it seems that the description of drugs should be such as to eliminate, as far as possible, the remotest hint as to source. While there is a difference in the relative per cent. of alkaloidal content in the several varieties, the difference is hardly sufficient to warrant a discrimination to the extent of excluding it from our country. Below are given analytical results of the varieties now to be dealt with:

	Rio Ipecac. Cultivated.	Rio Ipecac. Wild.	Carthagena Ipecac.	Johore or East India Ipecac.
Emetine	1.17 per cent.	1.45 per cent.	1.05 per cent.	1.32 per cent.
Cephæline	0.97 " "	0.52 " "	0.91 " "	0.33 " "
Other Alkaloids	0.07 " "	0.04 " "	0.14 " "	0.18 " "
Total Alkaloids	2.21 per cent.	2.01 per cent.	2.10 per cent.	1.83 per cent.

From the above results it can readily be seen that if the Pharmacopœial Committee is not somewhat flexible in this matter, difficulties are liable to arise. These can only be avoided by requiring the ipecac to contain a specified amount of total alkaloids, disregarding source of production.

THE PHARMACOPŒIA AS A LEGAL STANDARD.

For a number of years past the Pharmacopœia has been made the legal standard, *as it should be*, by the laws enacted in the various states. In order that such laws may be properly executed, there must be a controlling body, which investigates the various medicinal remedies, and brings the offender to justice—a chemist, a judge or a magistrate—and the standard must be fair and equitable in its demands.

The investigating bodies are made up in various ways and are given various titles, such as State Board of Health, State Pharmaceutical Board, Drug Commission, etc. Many of these organizations are influenced more or less by political issues; and their manner of executing the law is at times not what it should be. Whether this state of affairs will ever be changed time only can tell.

The chemist is frequently censured very severely on the ground that he ought to use his judgment as to whether an article is absolutely adulterated or is only contaminated to an extent brought about in the regular course of manufacture. The writer's sym-

pathies are certainly with the chemist, and he cannot see any justice in censuring him for doing his duty. Those who are finding fault with him should remember that they are lending encouragement to the breaking of the law, which the people in their own good judgment have caused to be made. If the standard is too rigid let the people make the necessary change, but refrain from criticizing the chemist because he complies with the law. He has no right to take it upon himself to make a report, basing it on his own individual judgment. If such a license should be given chemists, the law would certainly be of no effect, because each chemist would be at liberty to make his report irrespective of what the law requests. Justice cannot be administered by breaking the law.

In order that the investigations of pharmaceutical products be properly and efficiently conducted, such investigations should be placed in the hands of men who have had a pharmaceutical training. Men who have not had such a training are not in position to do efficient work.

The magistrate also is frequently censured because, like the chemist, he ought to use his discretion in each case as he saw fit. If such a condition obtained, there would be absolutely no use of the existence of any law. His duty plainly is to administer the law as it is enacted. On the one hand is the law, on the other the facts; he has no choice.

In coming to any conclusion, a standard must be adopted in every case. What that standard is will depend entirely on the condition of the case. In the case of many medicinal remedies, the Pharmacopœia fixes the standard, if the Pharmacopœia is the recognized authority. If the Pharmacopœia is too rigid, necessarily the drugs handled by the various pharmacists would not be up to the standard. We are sorry to say that quite a number of medicinal chemicals will not comply with this standard. As frequently pointed out, the requirements are too stringent. For example: It is practically impossible to make a chemical absolutely free from every trace of foreign material, and so produce an article which is 100 per cent. pure, as the Pharmacopœia requires in a number of cases. Those who think that an article can readily be made 100 per cent. pure, should ask Dr. Morely, the great authority on the atomic weights of oxygen and hydrogen, what it costs to make absolutely pure hydrogen or oxygen; or let them confer with any chemist who has ever made any molecular weight determinations, what it costs to make an article sufficiently pure for such work, to say nothing of 100 per cent. pure, and then compare the results with the present market conditions.

The writer's experience has been that manufacturers in general are very desirous of complying with the standard set by the Pharmacopœia, but in some instances they find that it is impossible for them to do so, because they are unable to find such articles in the market.

In conclusion, the Chairman wishes most heartily to thank the members of the Association for their kind co-operation and generous support during the past year. We have presented to this Section thirty-three papers; the largest number ever presented any previous year, and the papers, as a whole, are of superior excellence.

THE CHAIR: Gentlemen, you have heard the very able address of our Chairman, which is devoted on the one hand to the most important results in the discoveries of chemistry, and on the other hand to the revision of the Pharmacopœia. He has taken up some burning questions which will confront the Committee, and which I have no doubt will have the careful thought and consideration of the Committee. What is the pleasure of the Section in regard to the disposition of this address?

Mr. Lyons moved to refer to a committee of three, to report on the commendations made.

This motion was seconded by Mr. Mason, and carried.

MR. LYONS: Mr. Chairman, it has been suggested that we have already a committee that is dealing with some of these questions, and if this matter was referred to that committee it would facilitate the work of the Section, perhaps.

THE CHAIR: Do you withdraw your motion in regard to the appointment of a special committee?

MR. LYONS: I will explain what I mean. There is a report to be made by one of the regular committees—the Committee on Revision of the Pharmacopœia; and the suggestion is, that this committee be appointed, but that it report only after we have heard the Report of the Committee on Revision, which will come very shortly.

MR. ECCLES: The report of the Committee on Revision has not been read. It deals with some of the subjects presented in the Chairman's Address, and it would perhaps be well to have these matters considered together, especially as the Chairman takes one position and the Committee takes another in some regards.

MR. GOOD: I move to take up now the report of the Committee on Revision of the Pharmacopœia, which has been referred to this Section, so that it can be referred with the paper we have just heard—the Chairman's Address.

Chairman Kebler resumed the chair, and called for the Report of the Committee on Revision, which Mr. Eccles, chairman, made as follows, the report being received with applause.

REPORT OF THE COMMITTEE ON REVISION OF THE UNITED STATES PHARMACOPŒIA.

To the Officers and Members of the American Pharmaceutical Association:

Your Committee on Revision of the United States Pharmacopœia beg to report as follows:

Inasmuch as the work of revising the Pharmacopœia of 1900 is now practically finished, we find ourselves rather awkwardly situated as an advisory body. There is no further opportunity to make suggestions to the present revisors, that they can avail themselves of in the immediate work they are now engaged in. We cannot advise them of any changes that may be necessary for the revision of 1910, since we do not know what changes they have already made. The very points we suggest may be already embraced in the new volume, even in better form than that we are able to give, and it would be quite embarrassing to offer advice that is neither needed nor asked for. In the midst of this dilemma, however, we feel in duty bound to present something at this meeting, if only to keep up a show of willingness to perform our duty as best we can. There are a few points that have not been much discussed, and that fate may have withheld from the view of the Argus-eyed revisers; there are reforms that have been deemed premature and unacceptable for adoption in the present revision, but which may be suitable for the next one; and there are questions which if brought up now may succeed in starting debate thereon that will centre thought where much needed, in order to clear up regions of doubt.

Physiological Standardisation.—We think that this question deserves careful consideration by the Convention of 1910, and that by that time pharmacists should be prepared to accept this method. While the ordinary pharmacist will not be able to use such a test in determining the quality of his drugs, others will use it for him and report to him the results. But a small proportion of pharmacists use all of the tests now given. The benefit derived from their existence in the Pharmacopœia is none the less great. The few who do use such tests keep up the average quality of the goods, and those who do not or can

not use them get the benefit of the work of their more industrious or more skilled fellow pharmacists. Rival manufacturers are able to watch each other when such a test exists, and as China and Turkey fare well at the hands of their enemies because of rival interests, so pharmacists would fare better than they now do if as many galenicals as possible were standardized physiologically.

Standardization of Alkaloidal Content.—All drugs containing alkaloids capable of accurate alkaloidal standardization, should be so standardized, whether the average pharmacist is capable of doing such work for himself or not. There are those who can, and what they do will hold up the quality for the rest.

Manufactured Goods the Pharmacist cannot or does not Make.—There is a large line of goods that can be made by machinery cheaper and perhaps better than they can be made by the pharmacist. These goods should not be ignored by the Pharmacopœia. Whatever the physician prescribes that is not cursed with secrecy should be freely acknowledged.

Plasters.—Most of the ready-made plasters now used are made with a rubber base. What proportion of these are now used in filling prescriptions as compared with the number actually spread by pharmacists? Of those spread in the drug store, how many are spread from a plaster-mass made in the same store? An answer to these questions will quickly reveal the almost utter uselessness to the majority of pharmacists of that part of the Pharmacopœia now devoted to descriptions of methods for making plaster masses. Since the laws of many States pronounce the existence in any article bearing a pharmacopœial title of any ingredient not called for by the Pharmacopœia an adulterant, it is evident that pharmacists lay themselves liable to prosecution for selling plasters with official names, and having rubber bases. This of course means the great majority of those put up on prescriptions. The Pharmacopœia, in order to be up to date, and in order to keep the retail pharmacist from conflicting unnecessarily with the law, should acknowledge plasters made with machinery, and having rubber in their composition.

Solid Extracts.—These are rarely made by the pharmacist. Inasmuch as the claim is put forth that these can be produced cheaper and of equally good quality by aid of acetic acid instead of alcohol, it would be well to give manufacturers the acetic acid method as an alternative one, but under the title of "acetic extract." Extracts used in plasters might be made in this way or by the use of methyl alcohol. In the keeping of extracts of a pilular mass some method should be devised for their continuous preservation of the proper consistency.

Extract of Belladonna Leaf.—This has not given the satisfaction expected of it. It is suggested that it be dropped and that we return to the extract of the root. The stronger narcotic odor of the leaf makes it disagreeable, the chlorophyll it contains makes it stain, and the lack of constancy in alkaloidal contents renders it unreliable.

Belladonna Plaster.—This should be standardized. It is possible that the revision of 1900 will give us a standard of strength for this article. If not, then the committee might well consider the advisability of adopting some standard for 1910. It is advisable here as elsewhere, to bring the requirements of our Pharmacopœia as near as possible to the British and German. Our border line calls for agreement with the British more than that of any other. The British Pharmacopœial Conference submitted a formula for their Pharmacopœia that would lower their present standard on belladonna plaster just one-half if adopted. Mr. Kilmer, of New Brunswick, N. J., has suggested to your committee the advisability of making the strength of American plasters 0.3 per cent. of alkaloid, and Mr. Seward W. Williams proposes having it 0.5 per cent. Both gentlemen are experts in this line.

Belladonna Liniment.—This preparation contains nothing of therapeutic worth that is not better supplied by a solution of camphor and atropine.

Belladonna and Capsicum Plaster.—Much as this is prescribed by the medical pro-

fession, and much as it is sold to the laity by pharmacists, no attempt has been made to introduce it into the Pharmacopœia. We would suggest that such a plaster be introduced at the next revision.

Menthol Plaster.—The British Pharmacopœia has a formula for such a plaster. We suggest that it be adopted by our revisors.

Spirit of Ammonia.—Another method of preparation should be given. The present method, however carefully followed, only gives a spirit of from 6 to 7 per cent. ammonia strength. Using a mercury valve to increase the pressure, no better results could be obtained unless the directions of your committee of 1901 were followed by raising the temperature of the water-bath, and that a decided amount. A spirit of over 10 per cent. can easily be procured by doubling the quantity of stronger water of ammonia now called for, and then diluting to the required strength.

Solution of Hydrogen Dioxide.—The Pharmacopœia should tell how much acid should be permitted in this preparation, and should designate the kind of acid to be used.

Wine of Ipecac.—This preparation seems to have no therapeutic value other than that which an alcoholic solution of emetine hydrochloride possesses. The latter is susceptible of accurate standardization, and is therefore vastly preferable.

White Wine.—The present upper limit of alcoholic strength is 14 per cent. of absolute alcohol. The London *Lancet* has shown that natural wine may contain 15.5 per cent. of absolute alcohol by weight.

Compound Licorice Powder.—Between the senna leaves and the powdered licorice, a large amount of useless, if not injurious, lignin, is introduced into this preparation. Why not reduce the volume by using powdered extract of licorice, and thus make it easier to take, while retaining its efficiency. The senna contains enough indigestible material to act as a local irritant during its passage through the intestines.

Extract of Licorice.—Some method should be given for the exclusion of commercial extracts that have been adulterated with sugar and other water-soluble substances.

Organic Alkali Salts.—The test for such salts as sodium benzoate, sodium salicylate, etc., is likely to give wrong results unless the combustion is pretty complete. If any of the salt remains unburnt, or if decomposition products occur that are able to unite with the alkali, the results may be vitiated. For the estimation of the salt in the mixtures the test is still worse.

Creosote.—In the sodium hydrate test the amount of reagent ordered is too small. To every 4 Cc. 1.75 Gm. should be used.

C. M. RILEY,
RICHARD FISCHER,
H. H. BARTH,
JOHN F. PATTON,
R. G. ECCLES, *Chairman*.

THE CHAIRMAN: You have heard the report of the Committee on Revision. What is your pleasure, gentlemen?

Mr. Lyon moved to receive, and that a copy of it be sent to the Chairman of the Committee of Revision of the Pharmacopœia.

This motion was seconded by Mr. Bond and carried.

The Chair stated that the next order of business was a report from the Committee on Drug Adulteration, Mr. E. L. Patch, chairman.

Mr. Patch, after stating that two members of the committee had not yet signed the report—that they had not been able to get their signatures—then read the report as follows, applause following its presentation:

REPORT OF COMMITTEE ON DRUG ADULTERATION.

Your Committee were notified of their appointment very late in the season, so late that the majority of the committee have not found time to contribute. In consequence less has been accomplished than we might desire. However, aided by the chairman of the Scientific Section, a report is presented covering the examination of eighty-four articles, and the results obtained are shown in the subjoined table.

Soon after appointment your committee received a communication from Dr. W. H. Wiley, Chief Chemist to the Department of Agriculture, Washington, D. C., stating that the government had established a pharmaceutical laboratory for the study of the composition and adulteration of drugs, and he would be glad to cooperate with your committee.

Two lines of samples were submitted for examination, and the results will appear in a subsequent report. Others should be supplied, and the kind offer of Dr. Wiley made as helpful as possible.

We suggest that uniform methods of assay and the adoption of uniform standards be secured through the cooperation of this Association with the Drug Laboratory at Washington.

We recommend that the Section suggest to the general session the adoption of a resolution that in the judgment of this Association the appraising and inspection of drugs at our different ports should be placed under the supervision of the Drug Laboratory, thus securing uniformity not now existing.

Your Committee think the results obtained by the drug inspectors at our leading ports should be incorporated in the annual reports of this committee.

We suggest the advisability of incorporating with this report a supplementary report, to be contributed by Dr. Wiley, embracing such items as are herein tabulated.

Each member of the Association should promptly notify the Committee of any interesting or important variation in the quality of any drug or chemical coming to his attention, to make the annual report as full and comprehensive as possible.

Your Committee consider the establishment of the Drug Laboratory at Washington to be one of the most important events that have transpired in the history of American Pharmacy, and we recommend to the general session the consideration of the following resolutions in addition to that previously offered:

WHEREAS, We have learned that under authority of an act of Congress the Secretary of Agriculture has established a laboratory with the Bureau of Chemistry, to study the composition and adulteration of drugs; therefore,

1. *Resolved*, That the American Pharmaceutical Association offers to the Secretary of Agriculture its most cordial collaboration in this work, which promises so much benefit to the manufacturers of and dealers in drugs, as well as to the consumers thereof.

2. *Resolved*, That this Association will use its influence with the Congress of the United States to secure a reasonable appropriation to properly carry on this work in a systematic and effective manner.

3. *Resolved*, That the President and Secretary of the Association be authorized to convey to the Secretary of Agriculture a minute of these proceedings, and to represent the Association before the Committee on Agriculture of the House and the Committee on Agriculture and Forestry of the Senate, when the next agricultural appropriation bill is under consideration.

Respectfully submitted,

E. L. PATCH, Boston, *Chairman*,
EUSTACE C. GANE, New York,
A. B. LYONS, Detroit,
WM. K. ILHARDT, St. Louis,
HENRY KRAEMER, Philadelphia.

RESULTS OF EXAMINATIONS.

<i>Name.</i>	<i>Impurity.</i>	<i>Reporter.</i>
Acetic Ether.	Labeled "Absolute"; it assayed 86 per cent.; U. S. P. Standard, 98 per cent.	E. L. Patch.
Acid Benzoic, natural.	Several samples examined contained the artificial product.	L. F. Kebler.
Acid Chromic.	Contained large excess of sulphuric acid.	E. L. Patch.
Acid Hydrochloric, C. P.	Contained zinc.	E. L. Patch.
Acid Tannic.	Much sold that is not U. S. P.; will not dissolve in any proportion of water.	E. L. Patch.
Acid Tartaric.	Contained objectionable amount of copper.	E. L. Patch.
Ammonium Bromide.	Contained 6.72 per cent. chloride. The U. S. P. limit is 1 per cent.	E. L. Patch.
Ammonium Chloride, C. P.	Notable quantity of aluminum chloride and some clay.	E. L. Patch.
Arrow Root.	Was ordinary corn starch.	L. F. Kebler.
Asafetida.	Invariably mixed with mineral or earthy matter. One sample had 15 per cent. of mica, the glistening of which gave a striking appearance to the gum resin. The quality has improved of late owing to the care exercised by the U. S. appraisers.	E. H. Gane.
Avenine, alkaloid.	Does not form salts with acids. Does not respond to any of the alkaloidal reagents.	E. L. Patch.
Baking Powder.	25 per cent. of a mixture of talcum and tremolite, the latter in sharp needle-like splinters, insoluble in acids. D. C., March, 1902, Conn. Exp. Station.	E. L. Patch.
Balsam Copaiba.	Contained 20 per cent. heavy mineral oil.	E. H. Gane.
Beeswax.	Contains ceresin. Am. Jour. Pharm. Beeswax, 46.7 per cent.; ceresin, 11.7 per cent.; rye flour, 38.8 per cent.; moisture, 2.8. R. Berg, Chem. Ztg., 1902, 310.	L. F. Kebler.
Belladonna Leaf.	75 per cent. of samples examined below the standard of 0.4 per cent. alkaloid. Average, 0.31 per cent.	E. L. Patch.
Bismuth Salts.	All in the market contain traces of chlorides, and some excess of nitrates.	L. F. Kebler.
Blaud's Pills.	The greenish color claimed to be due to unoxidized ferrous iron, was due to presence of trace of potassium ferrocyanide.	E. H. Gane.
Bloodroot.	Mixed with root of Helonias dioica. E. M. Holmes, Ph. J., July, 1896.	E. H. Gane.
Bromides.	All contain excess of chlorides.	L. F. Kebler.
Calcium Iodide.	Tablets labeled $\frac{1}{2}$ gr. contained $\frac{1}{8}$ gr. only.	E. L. Patch.
Cherry Juice.	Claim 18 per cent. alcohol. Contains 9.6 per cent., 11 per cent., 10.5 per cent., 13.4 per cent., 13.9 per cent.	E. L. Patch.
Chloral Hydrate.	Is usually over-hydrated and has too low a fusing point, and contains chloride.	L. F. Kebler.
Cicuta Maculata.	Often substituted by conium maculatum	E. H. Gane.

<i>Name.</i>	<i>Impurity.</i>	<i>Reporter.</i>
(Water Hemlock).	(spotted hemlock), owing to confusing nomenclature of older books. Substitution difficult to detect when drug is powdered.	
Cocaine Hydrochloride.	Not completely soluble in water. Contained some unaltered Ecgonine.	E. H. Gane.
Cream of Tartar.	A mixture of 64 parts of cream of tartar, 31 parts of calcium superphosphate, and 5 of rice flour. Titrates over 90 per cent. Acid titration is not enough. Ignite, and titrate ash as a check. T. White, Analyst. 27, 118.	L. F. Kebler.
Creosote.	Coal tar creosote still frequently supplied. As this consists principally of carbolic acid, attention should frequently be called to the substitution.	E. H. Gane.
Echinacea Angustifolia (Black Sampson).	Collectors are not very familiar with this drug, and a number of substitutes have appeared at different times. One sent the writer consisted of the small branches of a plant closely resembling Castella Nicholsoni (Simarubæ).	E. H. Gane.
Elixir Gentian and Tinct. Chloride of Iron.	Claim: 4 minims of tincture chloride of iron to fluid drachm. Did contain: 1.33 minims, or one-third of the quantity claimed.	E. L. Patch.
Ergot of Rye.	Contains Ergot of Wheat. O. P. & D. Reporter.	L. F. Kebler.
Gluten Flour for Diabetics.	Practically all these flours are frauds. The amount of starch found in them is rarely more than 10 per cent. less than in ordinary flour. Examined by H. C. Sherman, H. M. Burr and E. H. Gane.	E. H. Gane.
Goat's Rue (Galega Officinalis).	There are several substitutes offered, the botanical origin of which the writer does not know. The fluid extracts supplied by different makers have been widely different in appearance, odor and taste, showing that they are made from different plants. The genuine article is difficult to procure.	E. H. Gane.
Golden Seal (Hydrastis).	Often contains large quantities of serpentaria rhizome. Odor of serpentaria may be distinguished in the powdered hydrastis. Also sometimes contains bloodroot.	E. H. Gane.
Goose Grease.	Contains cocoanut oil.	L. F. Kebler.
Honey.	Adulterated with sucrose.	L. F. Kebler.
Hypophosphites.	Nearly all contain chloride, or sulphate, or are slightly alkaline; contain carbonate or precipitate with lead acetate in 5 per cent. solution.	L. F. Kebler.
Insect Powder.	Mineral matter. Hellebore, colored with lead chromate. Large proportion of stem tissue, which is valueless.	E. H. Gane.
Iodides.	Usually have excess of chlorides and trace of sulphate.	L. F. Kebler.

<i>Name.</i>	<i>Impurity.</i>	<i>Reporter.</i>
Iron and Quinine Citrate.	Assay: 10.3 quinine, instead of 12 per cent. as labeled.	E. L. Patch.
Iron Reduced.	Rarely is U. S. P. Usually has too much sulphide.	L. F. Kebler.
Larix Europæa.	Mixed with or substituted by tamarack bark. (Larix Americana.)	E. H. Gane.
Linseed Meal.	Loaded with mineral oil.	L. F. Kebler.
Lithia Tablets 5 gr. Effervescent.	Assayed 2.2 grains.	E. L. Patch.
Lithia Citrate Eff. 8½ grains.	Assayed 1¼ grains.	E. L. Patch.
Lithium Salts.	The benzoate is the only salt approaching the U. S. P. requirements. Others contain excess of chlorides and sulphates. The citrate contains excess of water of crystallization.	L. F. Kebler.
Lycopodium.	Contained starch.	E. L. Patch.
Obesity Cure. 2 oz. bottle \$1.00. Very powerful.) Dose 10 drops.	Appears to be Fl. Ext. poke berries, reduced one-half and colored.	E. L. Patch.
Oil Almonds, Expressed.	Almost entirely displaced by oil of peach kernels and oil of apricot kernels.	L. F. Kebler.
Oil of Anise, U. S. P.	Rarely met with. Almost entirely replaced by star anise.	L. F. Kebler.
Oil Bergamot.	Adulterated with "bi-hydrochloride of terebinthin." Dr. Savatore, in Chem. & Drug., 59, 699.	L. F. Kebler.
Oil of Cassia.	Examination of market samples shows presence of lead derived from lead containers.	E. L. Patch.
Oil Cedar.	Largely composed of turpentine and allied to the "white oil of thyme."	E. H. Gane.
Oil Lavender.	Adulterated with 1.5 per cent. benzoic acid. Schimmel & Co. Report, Apr., 1902.	E. H. Gane.
Oil Linseed.	Contained 20 per cent. of petroleum oil. Adult. with mineral oil. O. P. & D. Reporter, May 12, 1902.	E. L. Patch. L. F. Kebler.
Oil Peppermint.	The cheaper grades are sometimes dementholized.	E. H. Gane.
Oil Rose Geranium.	No. 1. Optical rotation of sample: 50° 42'. Should not exceed 1° 55'. Is not soluble in any proportion of 70 per cent. alcohol or 91 per cent. alcohol. Probably consists largely of oil of ginger-grass. No. 2. Contains 95 per cent. of ester calculated as geranyl tiglate, and has sp. gr. 0.9316. A normal oil should not have over 35 per cent. ester, and not over 0.906 sp. gr.	L. F. Kebler.
Oil Turpentine.	Adulterated with a special petroleum oil called "white spirit." It lowers the sp. gr., lowers rotation figure, and leaves a large residue distilled at 205° C. (42 per cent. for the	L. F. Kebler.

<i>Name.</i>	<i>Impurity.</i>	<i>Reporter.</i>
	petroleum oil instead of 6 per cent. for the turpentine.) A. & P. Andruard. Pharm. Jour., 1654. P. 193.	
Oil of Wine, heavy (Ethereal Oil).	Practically the commercial oil of wine is either light oil of wine or a mixture of light and heavy oil.	E. H. Gane.
Oil Wormwood.	Seldom found U. S. P. Not in the market.	L. F. Kebler.
Paris Green.	Contained turpentine,	L. F. Kebler.
Pills of Quinine Sulphate, 2 gr.	Contained 50 per cent. plaster of Paris.	E. H. Gane.
Potassium Citrate.	Range from 1.83 gr. to 2.05 gr. Average, 1.97 grains.	E. L. Patch.
Potassium Cyanide.	Contained 3 per cent. of carbonate.	E. L. Patch.
	The commercial article is often a mixture of KCN and NaCN, or sometimes consists of NaCN only. This is an advantage for commercial purposes.	E. H. Gane.
Scammony Resin.	Adulterated with resin guaiac.	E. H. Gane.
Scammony.	Aleppo scammony generally contains a large amount of starch and assays only 30 per cent. resin.	E. H. Gane.
Shellac.	Mixed with rosin. E. J. Parry in Chem. & Drug.	E. H. Gane.
Sodium Chloride C. P.	Contained calcium in same proportion as ordinary table salt, and was in no wise superior.	E. L. Patch.
Sodium Phosphate.	Contained objectionable amount of arsenic and calcium phosphate. Sulphate ranges from 0.8 to 2.8 per cent.	E. L. Patch.
Sodium Salicylate.	Almost always contains excess of sulphate.	L. F. Kebler.
Spirit Ammonia.	Contained a large percentage of acetanilid.	E. H. Gane.
	The market does not furnish U. S. P. Is a mixture of stronger water of ammonia, 1 part; alcohol, 2 parts. Sp. gr. 0.865 instead of 0.81. Assay, 8.56 per cent. NH_3 instead of 10 per cent. NH_3 . 58 per cent. alcohol instead of 80 per cent.	E. L. Patch.
Sugar of Milk.	Contained aluminum salts. Contained coloring matter. Contained whey residues.	E. L. Patch.
Tinct. Iodine.	Contained croton oil. Br. & Colonial Drug.	L. F. Kebler.

ADDITIONS.

<i>Name.</i>	<i>Impurity.</i>	<i>Reporter.</i>
Asafetida.	Very poor quality. Best gives only 48 per cent. to alcohol. Some only 15 per cent. Average, 25 per cent. Results due partially to magnesia used for absorbing purposes.	C. G. Merrell.
Calcium Phosphate Precip.	30 per cent. calcium carbonate. Am. J. Ph., Jan., 1902, page 13.	W. K. Ilhardt.
Caramel.	Solid caramels are not up to claims for solubility and coloring power.	C. G. Merrell.
Carbolic Acid Crystals.	Difficult to obtain U. S. P. requirements. Congealing point too high.	C. G. Merrell.

<i>Name.</i>	<i>Impurity.</i>	<i>Reporter.</i>
Copaiba.	Seldom entirely free from Gurjun balsam tested by Kebler's modification of the glacial acetic acid and nitric acid test. A. J. Ph., 1895, 67-394.	W. K. Ilhardt.
Creosote, Beechwood.	Some of the imported has had the guaiacol removed, as shown by the high boiling-point.	C. G. Merrell.
Flaxseed Meal.	Contains 35 per cent. linseed oil. No mineral oil adulterant found.	W. K. Ilhardt.
Jaborandi.	Hard to find of standard alkaloidal strength. Averages about one-half.	C. G. Merrell.
Lanolin.	Melting point 46° instead of 40° .	W. K. Ilhardt.
Magnesia Calcined.	Contains much carbonate.	C. G. Merrell.
Oleoresin Capsicum.	Cheaper grades adulterated 50 per cent. with a gummy substance insoluble in alcohol, the nature of which has not been determined.	C. G. Merrell.
Oil of Wintergreen.	Two samples peculiar. Boiling point 215° C. instead of 218° to 221° C. In all other respects satisfactory. Half the so-called oil of wintergreen is adulterated from 10 per cent. upward with synthetic oil. A N. Y. house offers "genuine" oil at \$1.25 per pound, which is less than he offers the Penn. distillers. Difficult to test accurately.	

THE CHAIRMAN: The Chairman feels somewhat guilty in regard to the late appointment of this committee. After the resolution was passed at St. Louis, he was somewhat undecided as to what was meant, and consulted with a considerable number of gentlemen throughout the country, in the desire to put the committee's work into the best possible hands. After considerable correspondence, and after trying to get the help of some of the members of the Association who were influential in the wholesale world, I found I had to use my own best judgment at least in selecting the committee; but I am glad to say that, in placing Mr. Patch at the head of it, I think I made no mistake, for I have been very much pleased at the manner in which the work has been done so far. The report is before you, gentlemen. What will you do with it?

MR. WHRPLEY: This interesting report, prepared on such short notice, gives us a faint idea of what we would have had if Mr. Kebler had discovered the chairman of the committee earlier in the year. I move you, Mr. Chairman, that we receive the report and adopt the recommendation made therein.

And now, Mr. Chairman, in this connection, I want to say that Dr. H. W. Wiley, Chief of the Division of Chemistry in the Department of Agriculture of the United States, is with us this evening, and has already been extended the privileges of the floor by the general session, and no doubt if he is asked to do so here he will favor us with an explanation of some of the detail work proposed by the new department in this division of the government work.

Mr. Lloyd seconded the motion.

THE CHAIRMAN: It seems to me that, at this time, inasmuch as we have heard so much about the drug laboratory the government is about to establish, and Dr. Wiley's connection therewith, this would be a very appropriate time to extend the doctor the privileges of the floor, and, without objection, I will ask Dr. Wiley to kindly favor us with some remarks about this drug laboratory now being established.

Dr. Wiley arose to respond to this cordial invitation, being heartily applauded as he did so, and spoke as follows :

Mr. Chairman and Members of the Scientific Section : I thank you most heartily for the opportunity you have given me of saying a few words to-night about this work the government is about to undertake. I may be permitted to say at the outstart that it is a great deal easier to describe a work before it is done than it is afterwards. So I shall have an advantage now which will not be mine in the future. I do not come here to offer any advice or bring any contribution of learning to this Section, because I feel that any one attempting to bring chunks of pharmaceutical lore to this body would be carrying coals to Newcastle or beans to Boston. I come here by direction of the Secretary of Agriculture to learn something; and if I do not do it, and go back and report that I have not, I shall have a hard time of it. But I have already learned enough to pay the expenses of my trip up here, so I have no fear on that score.

I will state for your information that the Congress of the United States has authorized the Secretary of Agriculture to establish a laboratory in the Bureau of Chemistry of the Department of Agriculture, for the purpose of studying the composition and adulteration of drugs. Now, a great many people fail to see any connection between agriculture and pharmacy, but if you will reflect a moment you will see what a large contribution is made to pharmacy from the garden, field and forest. All these things—the gardens, fields and forests—are by act of Congress placed under the direction of the Secretary of Agriculture, so far as any Government investigations are concerned; and so we have here a very intimate connection between the products of the garden, field and forest and the work of this Association. I am not here to say that Congress did the wisest thing in placing this work here. There are other Departments where it might have been placed quite properly. It is an accomplished fact, however, and the Congress of the United States has a way of standing by its work. Some people have asked me, "Do you think that Congress will continue these investigations, or will it let them drop in a little while?" Now, I have been in the public service for twenty years, and I have never yet known Congress abandon a piece of work of this kind until it was finished, or until the end sought was attained. So I do not believe Congress will abandon the work it has undertaken—and especially now, when I feel this work will have the sympathy and support of this great body of pharmacists, representing the industry and the science of pharmacy throughout this great land of ours.

It would be premature for me now to attempt more than a bare outline of what we hope to do in this laboratory. In fact, your Chairman in his address to-night outlined a good part of the work that has already been considered. One of our troubles in the past has been the difficulty of securing agricultural chemists of worth. Twenty years ago, there was absolutely no uniformity of any kind on the part of the agricultural chemists of the United States or the world. Every man in that line of work—and there were not many—followed his own sweet will. The result was, that when we tried to make comparisons between the work of different chemists, we found great discrepancies. We did not know which one was the competent one, and which the incompetent. They simply followed their own methods and reached different results; and the illustration which the chairman used was a very common experience. Take the case of nitrogen, for example: Twenty years ago, the determinations would show widely varying results. I remember one instance of the determination of nitrogen where three chemists, from three different cities, reached results so far apart that one was three times as great as another. The average was all right, probably [laughter], but averages don't go in chemical determination. Each determination must be accurate, and we are not satisfied with approximate averages. I doubt not this experience has been duplicated many times. Now, one of the objects of this laboratory will be to unify, by association, com-

parison and conference, the methods employed by pharmaceutical chemists, and also in this way to secure uniformity of results. This can only be done by the pharmaceutical chemists coming together, as the agricultural chemists have done; and with the help of a laboratory, such as the Government will offer, it seems to me it will be easy to reach this unity of purpose and method.

Some people have the idea that the establishment of such a work as this by the Government will work a hardship on the druggists—the retailer, the wholesaler and the manufacturer. I do not think the men in Congress who enacted this law had any such intention, and I can assure you the Secretary of Agriculture has no such intention. On the contrary, the purpose is to help and aid, and not to annoy or embarrass. There is no intention on the part of the Secretary of Agriculture to interfere in any way with any legitimate method of manufacture or sale. The purpose we have in view is to help those who need help, and to control, if at all, only where there is wilful adulteration. Indeed, I may add that, as the law now exists, it does not give control at all—the only thing it authorizes is the investigation of the composition and adulteration of drugs. There are no penalties—no authority to interfere with any man's business; and there could not be, under a National law. The National Congress cannot come into a State and interfere with a man's private business. The National Government, under the Constitution, has no police control, whatever, in any State. The only thing it can do—and that is a desirable thing—is, when the States have acted, to control inter-State commerce: the Constitution permits that. In other words, any control of drug adulteration by the Federal Government would be exactly along the line of control of adulteration of food products—through the channel of inter-State commerce. But how can the State alone secure pure food and pure drugs through its own laws? It cannot go outside its own boundaries to punish the adulterator in another State. It has no authority outside its own boundaries; and hence, as we are a union of sovereign States, each independent in itself, until there is some controlling power among the States, passing the borders of the States, any State law must be only partially effective. In the future, if Congress should pass a law controlling inter-State commerce in this matter, then the laws of the various States affecting drug adulteration would become more effective.

And then this proposition should be considered—and it has been seriously and thoroughly considered by the manufacturers of food products. Since the state laws have no head, have no type, they differ greatly among themselves, and effect a great amount of annoyance to legitimate trade. Manufacturers have to have separate and distinct labels, in many cases, for the different states of the Union. A label good in Texas, say, is not good in New Jersey. But if there should be enacted a federal law in regard to food adulteration, the states would gradually, rapidly perhaps, shape their own laws to the law of the general Government; and so it would be as to drugs. And so far from annoying the wholesaler, the retailer and the manufacturer, a regulation of this kind would be a help in every branch of pharmaceutical trade.

I have come here to get the help, the assistance of this Association. The Secretary of Agriculture has no right to come among you and select a man for chief of the new drug laboratory—that right is in the hands of the Civil Service Commission. They have so completely taken possession of the government that I was moved to ask the president of that Commission the other day to please hold an examination to see if I was fit to draw my own breath. [Laughter and applause.] So the man you will get must come to us through that Commission. In a short time an examination will be held for those who are willing to apply for the position of chief of the drug laboratory in the Bureau of Chemistry in the Department of Agriculture.

Congress having started this laboratory and given it an appropriation, will continue it and support it liberally; and if you will adopt the resolution offered to-night, pledging your support and help and assistance to me before the committees of Congress, I have

no doubt that all you may reasonably ask for will be granted to you by your representatives in Washington.

Gentlemen, I thank you. [Great applause.]

THE CHAIRMAN: We have listened to an eloquent and inspiring talk from Dr. Wiley. Are there any further remarks on this report?

The General Secretary said that, in this connection, he would report the receipt of a letter from Mr. Bigelow, of the Department of Agriculture, enclosing a circular setting forth the character of examination required by the Civil Service Commission for the position of chief of the drug laboratory.

The motion of Mr. Whelpley to receive the report of the Committee on Drug Adulterations and adopt its recommendations was then put and carried.

The report of the Committee on the Ebert Prize was next called for, and, in the absence of the members of that committee, Mr. England, Secretary of the Section, read the report as follows:

REPORT OF COMMITTEE ON EBERT PRIZE.

The committee appointed to consider the award of the Ebert Prize, after having carefully examined all the papers presented at the forty-ninth annual meeting, have decided unanimously that the prize should be awarded to Messrs. J. O. Schlotterbeck and H. C. Watkins for their paper entitled, "Contribution to the Chemistry of Stylophorum Diphyllum," with honorable mention of the paper on "The Alkaloids of Glaucium Flavum," by Richard Fischer.

Signed,

EDSEL A. RUDDIMAN,
CHARLES H. LA WALL,
VIRGIL COBLENTZ, *Chairman*.

The report was received with applause.

On motion of Mr. Kremers, the report was accepted.

MR. GOOD: I will ask if it is not necessary that the resolutions offered by Mr. Patch a little while ago shall be referred to the Association in general session.

MR. CASPARI: That is stated, I think.

MR. PATCH: If I understood the action of the Section, it adopted the report with the recommendations, and the recommendations will go to the general body for its consideration.

THE CHAIRMAN: We will now pass to the nomination of officers at this sitting, but not their election. Nominations for Chairman are now in order.

Mr. Mason placed in nomination the name of Mr. J. O. Schlotterbeck, of Michigan, and Mr. Lyons seconded the nomination, saying that Mr. Mason had forestalled him in making the motion.

Mr. Schlotterbeck nominated Mr. Joseph W. England, of Philadelphia, for Chairman.

The Chair stated that if there were no further nominations for Chair-

man nominations for that office would be closed for this session, and nominations for Secretary would be in order.

MR. LYONS: Something has been said about the great desirability of continuing the same Secretary in office for a series of years. I know that it is a laborious office, and that it imposes a great burden on any one who fills the place; but for the sake of the continuity of the work of the Section it is exceedingly desirable, and so I move that our present efficient Secretary, Mr. England, be continued in that office for the ensuing year.

Mr. Hallberg seconded the motion.

The Chair stated that if there were no further nominations for Secretary, the regular order of business would be proceeded with, but added that other nominations might be made at the next session if desired.

MR. LYONS: The Research Committee is one of the committees of this Section, Mr. Chairman.

THE CHAIRMAN: I had no knowledge of that committee.

MR. LYONS: It is one of the committees of this Section, and it has a short report.

Mr. Mayo moved to proceed with the reading of papers, and this motion was seconded by Mr. Good and carried.

The Chair then called on Mr. Kraemer to read a paper contributed by Dr. Ernst Schmidt, of Marburg, Germany, on "Scopolamine and Scopoline."

Mr. Kraemer, first calling attention to the fact that the paper was in German script, which was always hard to read, and expressing regret that the Chairman had not selected some one better fitted to do this very valuable paper justice in its presentation, went on to speak of the lectures by Dr. Schmidt he had attended at Marburg, and of his peculiar zeal and earnestness which led him to continue his lectures during the Christmas vacation, when all the rest of the faculty were taking a rest—lectures which the students were eager to attend, being there at 8 o'clock in the morning to listen. He particularly recalled one occasion when, speaking on the subject of the alkaloids, Dr. Schmidt had greatly moved him by exclaiming, "Meine Herren—Die Alkaloide sind Pflanzenbasen," etc., in tones that reminded one of some great orator speaking on some great public question. Mr. Kraemer then presented the paper in abstract, the full text being as follows:

[Contributions from the Pharmaceutical-Chemical Institute of the University of Marburg:]

SCOPOLAMINE AND SCOPOLINE.

BY ERNST SCHMIDT.

(Translated from the original German by Richard Fischer, Madison, Wis.)

My previous investigations on scopolamine * have shown that this base

* Archiv. der Pharmacie, 1892, 1894, 1898.

is completely split up by boiling baryta water into scopoline and atropic acid :

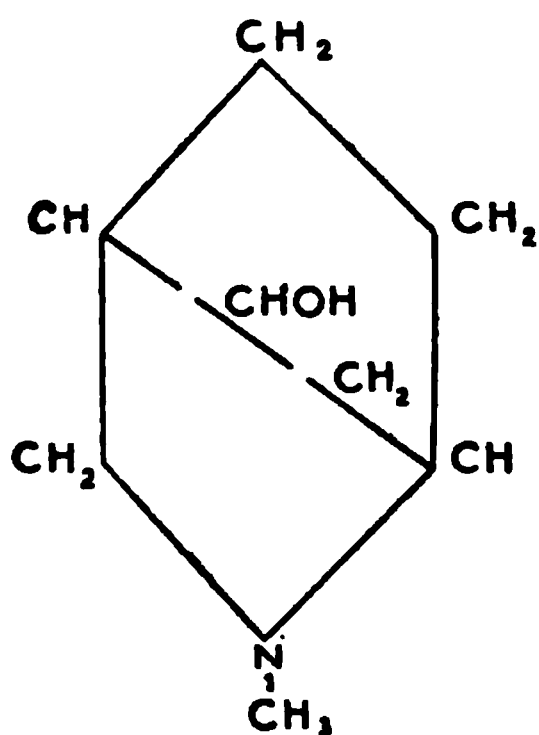


The products of this reaction are exactly the same, no matter whether optically active or inactive scopolamine is used. This change is similar to that by which atropine and hyoscyamine are split up under like conditions into tropine and atropic acid :

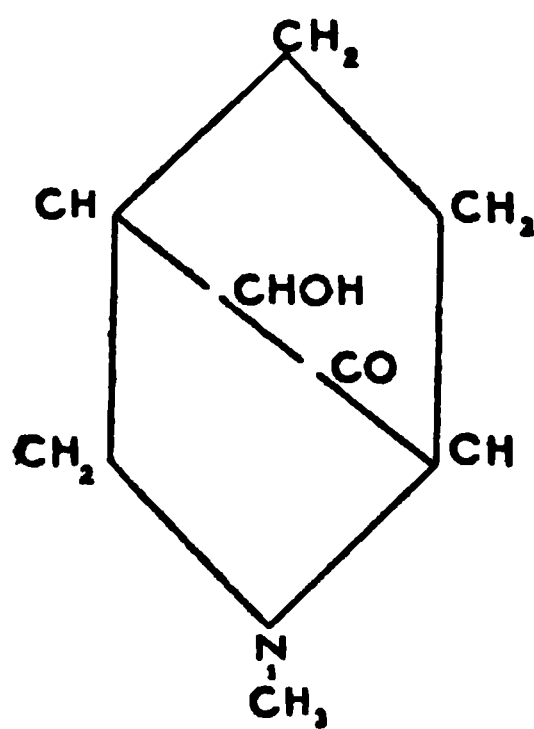


In other respects also, not to mention the corresponding mydriatic effect, similarities between atropine and hyoscyamine on one hand, and the active and inactive scopolamine on the other, are very apparent. Thus the investigations which *W. Luboldt* and myself carried out on scopoline showed that the former, like tropine, is a tertiary base. It was further shown that scopoline and tropine each contain one hydroxyl group, and that the *N* atom in both bases occurred in the group $\text{< N} - \text{CH}_3$.

These relations between tropine and scopoline seemed to have found a simple expression in the formula which *Eykman*, using *Merling's* formula for tropine, evolved for scopoline from physical considerations (from observations of the refractive power) :



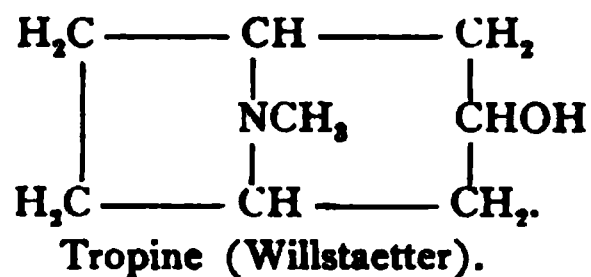
Tropine (Merling).



Scopoline (Eykman).

Although all the observed chemical properties of scopoline agree with the above formula, its correctness must at present be considered doubtful, for independent of the fact that the presence of a *CO* group has never

been proved, the excellent investigations of *Willstaetter* have shown that tropine contains a penta- and not a hexa-carbon chain :



In my further investigations on the constitution of scopoline, which I have undertaken in continuation of *W. Luboldt's* work, my next object was to characterize the second oxygen atom of the base : In the first place, using *Eykman's* formula, to determine whether or not scopoline contains a ketone group. The presence of such a group seemed probable, since *Luboldt*, by completely methylating scopoline, had succeeded in obtaining a *N*-free body which reacted with phenylhydrazine. The numerous attempts which I have carried out in this direction, at the cost of much time and material, have, however, led to negative results.

My first attempts were to treat scopoline directly with hydroxylamine : although the experiments were conducted under the most varied conditions, no oxime could be obtained.

Since it seemed possible that the *OH* group, which according to *Eykman's* formula is neighboring to the *CO* group, might exert a negative influence upon the formation of an oxime, the experiments were repeated with acetyl-scopoline, but with no better results. Neither could an oxime be isolated by using methyl-scopoline or acetyl-methyl-scopoline, nor were the results better when phenylhydrazine was brought in contact with scopoline under various conditions. Likewise semicarbazid and amidoguanidine failed to react upon this base.

After these negative results, the exhaustive methylating of scopoline was tried, a reaction by means of which *Luboldt* had obtained a *N*-free body which phenylhydrazine apparently changed into a phenylhydrazone. The results obtained agree in general with those of *Luboldt*. I also obtained an *N*-free body whose properties however did not seem inviting to further study, the less so since the yield was a very small one.

In the course of the above work, however, I obtained a methyl-scopoline whose formation had not been observed by *Luboldt*. It was in the form of a light yellow, rather viscous, strongly alkaline liquid of a weak narcotic odor. Upon evaporation of an ethereal solution, a part separated out in long, needle-like crystals, while the greater portion retained its oily consistency. Upon drying by pressing upon porous plates and recrystallizing from water, colorless needles were obtained which melted at 69–70° C. This base, in distinction from the liquid methyl-scopoline, yielded a gold salt consisting of shining, feather-like needles, melting at 154° C.

N found : 38.72, 38.61 per cent. calc. : 38.64 per cent.

Attempts to change the suspected *CO* group into a *CHOH* group by reduction also proved futile, no matter whether the reducing agent employed was zinc and hydrochloric acid, sodium amalgam, sodium in boiling absolute alcohol solution, sodium in boiling amyl alcohol or aluminum amalgam in alkaline solutions. Concentrated hydriodic acid and zinc dust which were brought in contact with scopoline according to *Willstaetter's* directions, also failed to exert a reducing action upon this base. The attempt to obtain an additional product of hydrocyanic acid and scopoline by the use of aqueous hydrocyanic acid of approximately 12 per cent. strength, or of potassium cyanide and hydrochloric acid, also gave negative results.

To identify the products of the above reactions, gold double salts were formed. In most cases only the typical crystals of scopoline gold chloride were obtained. However, from the products of reaction with hydroxylamine, as well as those resulting from the action of sodium upon a boiling solution of scopoline in ethyl or in amyl alcohol, a gold salt was obtained differing from the typical scopoline gold chloride. The former separated from concentrated solutions in shining yellow scales which did not change their form even upon long standing in the mother-liquid. Upon spontaneous evaporation of the solvent, large transparent plates of rhombic form were produced. This gold salt differed but slightly in melting point from scopoline gold chloride, but it contained one molecule of water of crystallization, while according to my previous observations, the latter salt crystallizes either without any or with one-half molecule of water of crystallization. The corresponding platinum salt yielded shining prismatic crystals, which differed from scopoline platinic chloride in not containing any water of crystallization. The corresponding hydrochloride crystallized in shining scales, which, like scopoline hydrochloride, contained one molecule of water of crystallization. Upon distillation of this likewise optically inactive base, gold and platinum salts of the form and composition of the ordinary scopoline salts were obtained.

BEHAVIOR OF SCOPOLINE TOWARD HYDRIODIC ACID.

From the experiments which *W. Luboldt* carried out at my instigation, it was shown that scopoline, when heated at 150–160° C. for three hours with hydriodic acid, sp. gr. 1.7, in the presence of a little amorphous phosphorus, remained practically unaffected. By employing hydriodic acid of sp. gr. 1.9, and using higher temperatures, different results are obtained.

If scopoline is heated for 3–4 hours at about 150° C. with hydriodic acid, sp. gr. 1.9, in the presence of some amorphous phosphorus, a little unchanged scopoline may still be found among the products of the reaction, but at the same time a compound richer in iodine is formed: the *hydroiodide of hydroiodoscopoline*. For the purpose of isolating the latter compound, the contents of the tube were freed from hydriodic acid by evap-

oration on the water-bath, the residue dissolved in water containing a little sulphurous acid, and the resulting solution allowed to crystallize. Pale yellow, difficultly soluble, prismatic crystals first separated out, which were readily obtained colorless by recrystallizing from a little boiling water, m. p. 196° C. The analysis of this compound gave the following results:

I.....61.51 per cent.

61.86 per cent.

If the hydriodic acid had acted upon scopoline in a manner analogous to its action upon tropine as determined by *Ladenburg, i. e.*, if anhydroiodide of iodoscopoline, $C_8H_{12}INO.HI$, had been formed by the replacement of the hydroxyl group by iodine, the compound should have contained 64.2 per cent. of iodine. The above data, however, are in accord with a compound of the formula $C_8H_{13}NO_{2.2}HI$ or $C_8H_{14}INO_{2.2}HI$. While silver nitrate in the cold precipitates only half of the iodine of *Ladenburg's* hydroiodide of iodotropine ($C_8H_{14}IN.HI$) as silver iodide, all of the iodine of the above scopoline derivative can be directly precipitated upon standing. The preparation of this scopoline derivative in large quantities meets with some difficulties, since at 150° C. a part of the scopoline remains unaffected by hydriodic acid, while at higher temperatures the reducing action of the acid comes into play. This reduction product of scopoline is probably analogous to that produced by the action of hydrobromic acid on this base (see below).

Essentially different from the above is the action of hydriodic acid at $190-200^{\circ}$ C. For the purpose of studying the reaction under these conditions, scopoline was heated for six hours at $190-200^{\circ}$ C. with the four-fold quantity of a cold saturated solution of hydriodic acid and a sufficient quantity of red phosphorus. Upon opening the tube considerable pressure became apparent. The products of the reaction consisted of a slightly colored liquid, from which small quantities of a black tarry mass separated out upon standing. Upon the surface of the liquid floated a very mobile liquid of petroleum-like odor, apparently a hydrocarbon. Upon separating this portion and adding an excess of potassa to the remaining liquid, a strongly narcotic odor, slightly resembling that of coniine, became apparent, a proof that under the above conditions, a volatile base besides other bodies had been formed.

To obtain this volatile base, which apparently made up the greater portion of the liquid, into a form suitable for analysis, the contents of the tube were freed from hydriodic acid as much as possible by heating on the water-bath, the residue dissolved in alcohol, and the resulting brown solution freed from iodine by sulphurous acid, and finally digested with silver chloride in excess. The almost colorless liquid thus obtained was used for the preparation of platinum and gold double salts.

From another portion of the reaction product, the volatile bases were isolated by treating with sodium hydroxide and distilling. The platinum

and gold salts prepared from this distillate proved identical with those prepared directly as above stated.

Platinum Double Salt.—The platinum double salt, prepared according to either of the above methods, and re-crystallized, consisted of well-developed, reddish-yellow, transparent crystals, free from water of crystallization. Analysis gave the following results :

C	29.10 per cent.	29.24 per cent.	—	—
H	4.86 per cent.	4.88 per cent.	—	—
Pt	—	—	29.32 per cent.	29.24 per cent.

	Calculated for $(C_8H_{15}N.HCl)_2PtCl_4$.	Calculated for $(C_8H_{13}N.HCl)_2PtCl_4$.
C	29.11	29.30
H	4.84	4.27
Pt	29.49	29.67

Gold Double Salt.—Yellow feather-like crystals, rather difficultly soluble in cold water. Analysis of the salt :

		Calculated for $C_8H_{15}N.HCl.AuCl_3$.	Calculated for $C_8H_{13}N.HCl.AuCl_3$.
C	20.79 per cent. —	20.67	20.75
H	3.49 per cent. —	3.44	3.02
Au . . .	— 42.49 per cent.	42.30	42.49

From these analytical data, for which I am indebted to *J. Gadamer*, it becomes apparent that the substance in question is an oxygen-free base of the composition $C_8H_{15}N$. This base, which for the present will be called *hydroscopolidine*, shows certain similarities in odor as well as in other properties with *hydrotropidine*, $C_8H_{15}N$, which *Ladenburg* obtained by the action of nascent hydrogen upon tropidine and upon tropine iodide. It seems, however, that hydroscopolidine, the reduction product of scopoline, is not identical with hydrotropidine; at any rate the crystal forms of hydroscopolidine platinum chloride do not correspond with the descriptions which *Liroch* gives concerning hydrotropidine platinum chloride. Nor is there any correspondence (as I am informed by *Dr. K. Busz*) between the platinum salts of hydroscopolidine and of tropidine.

In the mother liquors of the platinum and gold salts of hydroscopolidine, very appreciable quantities of the corresponding double salts of methylamine were also present. A part of the scopoline must therefore have broken down completely under the influence of the hydrochloric acid into methylamine and a nitrogen-free body, probably a hydrocarbon. The mobile liquid of petroleum-like odor, above described as floating on the top of the tube contents, was probably identical with the latter.

BEHAVIOR OF SCOFOLINE TOWARD HYDROBROMIC ACID.

Because of the difficulty of preparing large quantities of the hydroiodide

of hydroiodoscopoline, the attempt was made to prepare the corresponding bromine derivative. After several preliminary trials, the preparation of this substance was successfully accomplished. If scopoline is heated for six hours in a petroleum-bath oven at 130°C . with five times its weight of aqueous hydrobromic acid saturated at 0° , a brownish liquid results, from which, after evaporating to dryness and frequent recrystallizing of the residue from water or alcohol, colorless prismatic crystals can be obtained. These crystals are fairly readily soluble in water, more so in alcohol. Heated rapidly they melt with decomposition at $202\text{--}203^{\circ}\text{C}$.

Result of analyses :

Br.....	50.23	50.69	50.59	50.65 per cent.
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Of this bromine somewhat more than one-half was precipitated as AgBr by AgNO₃ at ordinary temperatures.

The hydrobromide of hydrobromscopoline ($\text{C}_8\text{H}_{13}\text{NO}_2 \cdot 2\text{HBr}$ or $\text{C}_8\text{H}_{11}\text{BrNO}_2 \cdot \text{HBr}$) requires 50.47 per cent. Br.

Acetyl derivative. To determine the number of hydroxyl groups, the above hydrobromide was mixed with acetic acid anhydride and kept at a slight ebullition for two hours. The excess of acetic acid anhydride was then evaporated off on the water-bath, the residue dissolved in dilute alcohol, and changed into the corresponding chloride by means of silver chloride. The resulting pale yellow solution was freed from colored impurities by the addition of a little auric chloride, and the filtrate completely precipitated with the same reagent. A resin-like precipitate resulted which gradually hardened upon boiling. This was dissolved in alcohol and the solution allowed to evaporate spontaneously. In this manner beautiful transparent plates of a golden yellow color were obtained which melted with decomposition at 189°C .

The analyses gave the following results :

	Found.	Calc. for $\text{C}_8\text{H}_{11}\text{BrN}(\text{O} \cdot \text{C}_2\text{H}_5\text{O})_2 \cdot \text{HCl} \cdot \text{AuCl}_3$
Au.....	30.02 per cent.	29.85 per cent.
C	22.01 per cent.	21.86 per cent.
H.	2.82 per cent.	2.88 per cent.

These data indicate that through the action of hydrobromic acid a second hydroxyl group is formed in the scopoline molecule. For the purpose of further investigating this remarkable observation, some of the hydrobromscopoline was freed from bromine by means of zinc and sulphuric acid, and the resulting compound also treated with acetic acid anhydride. The gold double salt of this acetyl derivative crystallized from alcohol in yellow, transparent scales having a slightly glassy surface and melting at 185°C .

The analyses furnished the following data :

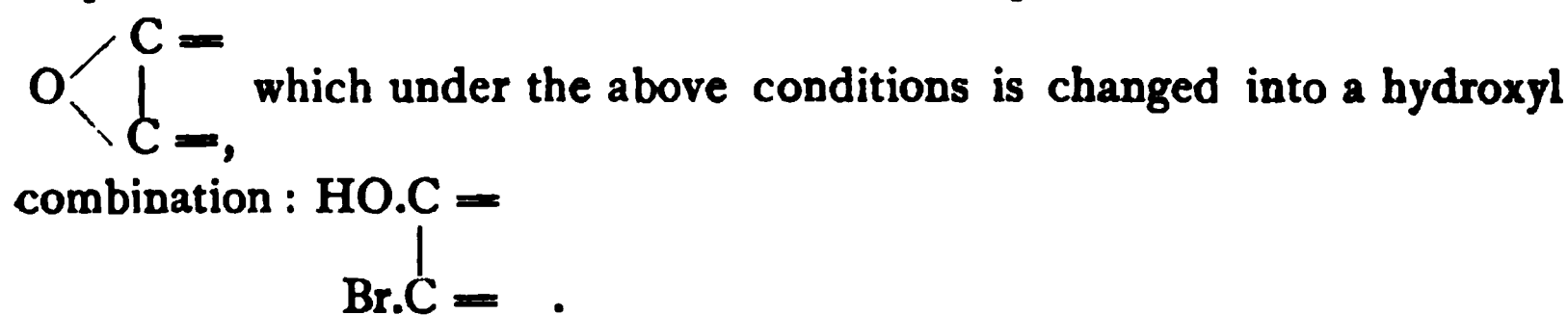
	Found.	Calc. for $C_9H_{13}N(OC_7H_5O)_2.HCl.AuCl_2$.
Au.....	33.81 per cent.	33.94 per cent.
C.....	24.74 per cent.	24.78 per cent.
H	3.52 per cent.	3.44 per cent.

Benzoyl derivative.—Another portion of the compound obtained by the reduction of hydrobromscopoline was benzoylated according to the method of *Schotten* and *Baumann*, and then changed into a gold double salt. The latter crystallized from alcohol in translucent, wart-like forms which melted at 200–201° C.

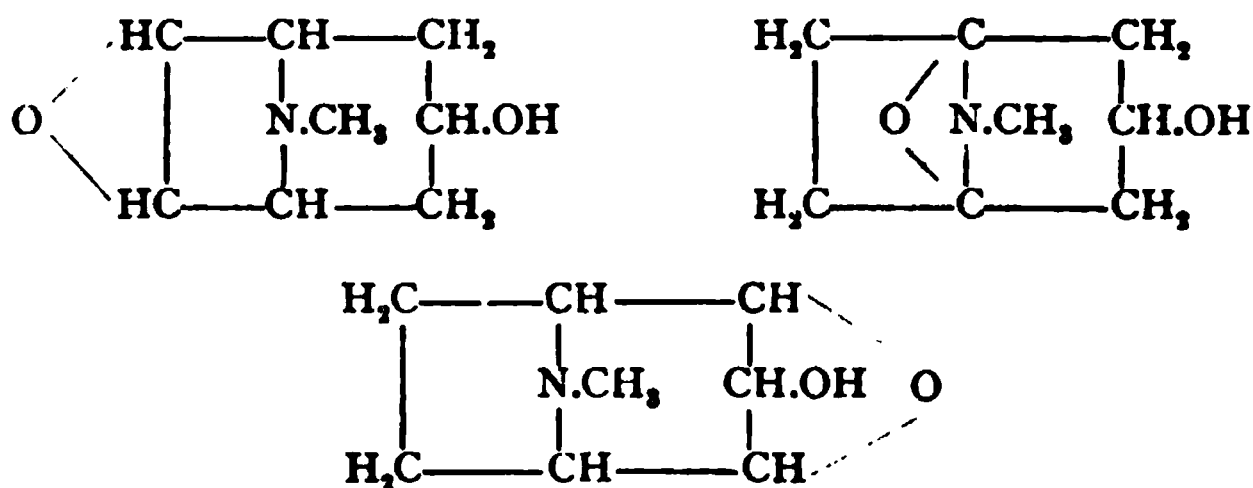
Results of analyses :

	Found.	Calc. for $C_9H_{13}N(OC_7H_5O)_2.HCl.AuCl_2$.
Au.....	27.49 per cent.	27.89 per cent.

The above analytical data, for which I am indebted to *M. Litterscheid*, show that scopoline, which *a priori* contains only one hydroxyl group, is changed by the action of hydrobromic acid into a compound which must be regarded as a dihydroxyl derivative. This intermolecular change can only be readily explained by assuming that the second oxygen atom in the scopoline molecule exists in an ether- or morpholine-like combination :



Taking into consideration the optical inactivity of scopoline, its behavior towards oxydizing agents and other reagents which I shall report on in another paper, as well as its relations to tropine, the following formulæ for scopoline come up for consideration :



The further investigations on scopoline and hydrobromscopoline, which I wish to reserve for myself, may decide which of the above formulas is the correct one.

Marburg, Germany, July 12, 1902.

Mr. Kraemer's presentation of the chief points of Dr. Schmidt's paper was applauded.

THE CHAIRMAN: You have heard this interesting abstract of this most interesting paper. Are there any remarks? If not, we will continue with the next paper.

MR. CASPARI: I move to accept the paper, with thanks, and refer it to the Publication Committee. That is customary, and unless the paper is accepted it does not belong to the Association.

Mr. Mayo seconded the motion, and it prevailed.

THE CHAIRMAN: The next paper is on "Guaiac-Blue and Aloin-Red," by Dr. Edward Schaer, Professor of Pharmacy at the University of Strassburg. A brief abstract has been prepared, and Mr. Caspari will now present it.

MR. CASPARI: Mr. Chairman, and fellow-members, it is truly gratifying that, at this session of the Scientific Section, we are in possession of papers from two of our honorary members abroad. This paper is not in German, but in English. We all know that Dr. Schaer has done interesting work along this line.

Mr. Caspari then gave a verbal abstract of the paper, the full text being as below:

ON GUAIAIC-BLUE AND ALOIN-RED AND THEIR USE FOR CHEMICAL REACTIONS.

BY ED. SCHAEER, M. D.

In the long course of investigations by the well-known chemist of Bâle, *C. F. Schönbein*, the blue color reaction of guaiac resin with oxidizing agents, especially with ozone or "active" oxygen, played a rather prominent part, and since that time this reaction has been put into use for the detection of a certain number of other chemical bodies.

It may, for the present, be accepted as a well-established fact, as I have pointed out elsewhere,* that the blue-colored substance derived from guaiac resin in various oxidizing-reactions—be it formed by the action of ozone, of bromine, of chromic acid or of cyanides of copper, or finally of hydrogen peroxide in presence of platinum, blood or ferments—represents in all cases the same chemical combination, viz., an oxidation-product of a constituent of the resin, "guaiaconic acid" first described by *Hadelich* in 1862. The numerous observations of *Schönbein* concerning the coloration of the resin and the behavior of the blue matter, endowed with remarkable coloring power, had led him to believe that this blue product of oxidation ought to be considered as an "organic ozonide," or in other words that the said constituent of the resin, in the different oxidizing reactions, unites to form a loose combination with chemically active oxygen (or ozonized oxygen), the product being of rather labile character and therefore easily discolored by reducing agents, in the same way as the inorganic ozonides (peroxides of lead and manganese, chromic acid, per-

* See "Ueber die Anwendungen des Guaiakharzes als Reagens" in *Forschungsber. über Nahrungsmittel, Hygiene, Pharmakognosie etc.* herausg. v. *A. Hilger*, München III (1896.) No. 1.

manganic acid, etc.). Since all newer observations seem to corroborate the opinion of the celebrated investigator of oxygen, we cannot object to the designation of "ozonide of guaiaconic acid" for the oxidation-product of the resin, which may be simply called guaiac-blue, although the acceptance of ozonized oxygen in *combinations* seems to be at variance with some of the more recent chemical theories.

The importance due to guaiac-blue in the numerous and very different reactions performed by means of guaiac resin could not fail to induce ever and anon new observations concerning its formation, its chemical nature and its chemical changes. Since the time of *Hadelich*, who was the first to designate guaiaconic acid as the mother-substance of guaiac-blue, several authors have been engaged in the study of these questions, as for instance, *O. Doebner*,* who has published (together with *E. Lückner*) a series of experiments on the formation and chemical composition of the said blue product. For the preparation of guaiac-blue he used an alcoholic solution of guaiaconic acid, which was treated with ferric chloride, the separated blue substance being purified by means of benzene. Notwithstanding the numerous new facts brought out in these recent investigations, a certain number of questions concerning the ozonide of guaiaconic acid does not yet seem to be as fully answered as would appear desirable in view of the practical importance of guaiac reactions.

In the course of a rather exhaustive study of guaiac resin, guaiac wood and Palo balsams, by *E. Paetzold*,† further observations concerning the formation and physico-chemical qualities of guaiac blue have been gathered, the chief points of which may be stated as follows: Owing to the great sensitiveness of guaiac-blue towards acids and alkalies, methods of preparation by which such bodies will be formed as secondary products, are best avoided. Making use of the observation that guaiac-blue is insoluble, or rather scarcely soluble, in ether, and therefore can be precipitated from its solutions in certain liquids, a solution of pure guaiaconic acid in chloroform was first prepared; this latter was then agitated with chemically pure peroxide of lead, known to be intensely active towards guaiac resin, and finally the blue colored solution, after filtration, was mixed with an excess of ether. The blue compound thus separated, washed with ether and freed from the latter by a current of air, after being cautiously dried, is a powder of deep indigo-blue color, and seems to be rather stable when protected from light, although a slight change of color will take place even then, caused by some oxidation of the loose chemical compound. This guaiac-blue is known to be easily soluble in methyl and ethyl alcohol, chloroform, glacial acetic acid, and acetone, less soluble in acetic ether, and scarcely soluble in ether and benzene and its homo-

* *Archiv. der Pharmacie*, 238 (1896).

† *Inaugural-Dissertation der Univ. Strassburg* (math. naturw. Facultät), 1901.

logues. The color of the solutions of guaiac-blue is not quite the same in all cases; while the solutions in most of the derivatives of alcohol show the characteristic deep blue color with a reddish tint, the solutions in acetone and acetic ether are of a more reddish-violet color, changing gradually to blue by addition of water. Without doubt the guaiac-blue, which *Paetzold* considers as formed only by a part of the so-called pure guaiaconic acid, possesses an unusual coloring power, analogous to that of the aniline compounds, and readily accounts for the extreme sensitiveness of the guaiac reactions.

The different spontaneous decompositions of guaiac-blue, already noticed by *Schonbein* as well as by later observers, are of special theoretical and practical interest, as ignorance concerning these phenomena has often proved prejudicial to a general use of guaiac resin as a reagent.

Besides the action of light to be mentioned hereafter, guaiac-blue is very sensitive toward certain chemicals, undergoing a chemical change followed by decoloration. It was observed long ago that numerous inorganic and organic substances, possessing reducing power, cause a decoloration of blued guaiac tincture by decomposition of the blue product, and that, to a certain degree, even the solvents of the resin and the resin itself, or rather its different constituents may act in this way, this fact explaining many cases of spontaneous decoloration of the blue-colored resin solution. Yet it may be stated that *chemically pure* solvents as alcohol or chloroform yield rather stable solutions of guaiac-blue even after gently warming, and that in many cases the decoloration is the result of other influences.

The decomposition of the blue compound occurs readily in contact with different acids, even when these are present in highly dilute form, but, strange to say, the decolorizing power does not always agree with the so-called strength of the acids. The action is very strong in the case of sulphuric, hydrochloric and salicylic acids, less so with tartaric, citric and formic acids, and relatively feeble with benzoic and especially with acetic acid, which latter may therefore conveniently be used in guaiac reactions, where it is necessary to neutralize an alkaline solution.

It should be mentioned that the acids exert a much feebler influence on guaiac-blue when the latter is dissolved in liquids not miscible with water; the same behavior is shown by alkalies and also by reducing agents. These observations have led *E. Paetzold* to a rather important modification of guaiac reactions, viz.: to the use of a chloroform solution of guaiac resin (or guaiaconic acid) instead of the ordinary alcoholic solution of 1-5 per cent. Guaiac-blue being very freely and quickly soluble in chloroform is in this way protected against the decomposing action of substances in the watery solutions.

The action of alkalies, caustic, carbonates and other alkaline salts, is even more conspicuous than the influence of acids. Even minute quanti-

ties are able to decolorize solutions of guaiac-blue and also to prevent the blueing of guaiac tincture by oxidizing agents. Even certain plant alkaloids of pronounced alkaline character may show this action; an exception is to be made, however, provided an excess of ammonia be avoided, in the case of combinations of copper salts with ammonia.*

In all probability the influence of alkaline bodies on guaiac solution depends on the property of alkalies to accelerate and to favor innumerable oxidations by free oxygen and oxidizing agents, and it seems fair to assume that the transfer of the loosely combined but chemically active oxygen-atoms in the guaiac-blue to the resin substance or other oxidizable compounds is facilitated under the influence of alkaline reaction.

As regards the behavior of light, this agent is known to manifest a distinct action on guaiac resin, *i. e.*, guaiaconic acid, as well as on guaiac-blue. First, the action of light favors the well-known spontaneous oxidation, viz.: blueing of guaiac resin (for instance, in powdered resin or powdered guaiacum wood) and of several solutions of the resin or of guaiaconic acid; secondly, the action of light, especially of direct sunlight deprives the resin or its active acid of the property to be blued by oxidation; lastly, the effect of light is to accelerate very distinctly the well-known decoloration of the blued tincture and also the above-mentioned decoloration by means of acids and of alkalies.

The behavior of a solution of guaiac-blue in concentrated solutions of chloral hydrate (70–80 per cent.), is also of interest, these solutions showing a most striking solvent power for vastly different bodies. The said solution of a deep blue color changes even in the dark, but in a much shorter time when exposed to the light, and assumes a greenish-brown tint; most likely this change of color is due to the action of small quantities of acid derived from the chloral hydrate. Notwithstanding the new observations in regard to guaiac-blue, there yet remains more than one question for further investigation and elucidation, which seem to be all the more difficult since many guaiac reactions occur under rather complicated circumstances.†

The same theoretical importance which is attached to guaiac-blue and its changes, in the question of oxidation, especially the supposition of intermediate compounds of loose character, may also, it seems, be assigned

* I have shown in 1874 (*Zeitschr. f. Analyt. Chemie v. Fresenius.*) that copper salt solutions, sufficiently diluted not to change tincture of guaiac, assume at once a blueing action by addition of minimum quantities of ammonia, just as is the case with addition of soluble cyanides and hydrocyanic acid.

† One of these questions, the relation of guaiac-blue and its mother substance to the compounds contained and formed in self-blueing fungi (*Boletus spec.*, etc.), has been at least partially solved by the recent studies of *G. Bertrand*, of Paris, who has shown (*Ann. de l'Institut Pasteur*, XVI, 1902, p. 179) that these plants contain a derivative of benzene, boletol, which by atmospheric oxygen in connection with "oxydases," is oxidized and changes from yellow to a red-blue color.

at least in some degree to another oxidation-product, that of aloin, which had been observed many years ago, and regarding which I have made further investigations during the past two years, proposing the name of aloin red for this compound. This product is not altogether devoid of practical interest, as it can be used for a number of most sensitive reactions concerning aloes and other substances to be mentioned later on.

As regards the formation of aloin-red, the very first studies of this compound could not leave any doubt about its character as an oxidation product and the author, *A. Klunge*, pharmaceutical chemist at Aubonne (Vaud), did not fail to point out the analogies between the aloes-reaction and the guaiac-copper reaction for prussic acid.* He had shown that even a very dilute aloin solution, or an aqueous extract of aloes, strikes a greenish-red color upon addition of some copper solution, which is changed to an intense purple-red color (raspberry tint), as soon as even minute quantities of hydrocyanic acid are added. Furthermore, he showed that analogous changes of color take place, if instead of this cyanic compound some haloid salt is used. This last observation seemed to me to strengthen the above-mentioned analogy of guaiac-blue and aloin-red reactions, since I had already observed in 1874† that alcoholic guaiac solution containing some very dilute copper solution (sulphate) is not only blued by addition of hydrocyanic acid, but also of small quantities of haloid salt, even when chloride of copper is used as the copper salt.

Being aware of the prominent correspondence of conditions for the formation of guaiac-blue (guaiac-copper reaction), and of aloin-red (aloin-copper reaction), and deeming it necessary to study the behavior of other cyanic compounds towards an aloin solution containing copper (as I had done many years ago concerning the blueing of guaiac solution by cyanic compounds of copper‡), I resolved to investigate this matter more thoroughly. The results of these observations have been published in a German pharmaceutical periodical,§ and may be mentioned here inasmuch as they are connected with the phenomenon of guaiac-copper reaction, which had been a subject of study for *Schönbein* as early as 1868, and quite independently of the author of this paper.

As regards the formation of aloin-red from the so-called *barbaloin*,|| (= aloin of the Barbodoes-aloes), it has been stated that this purple-col-

* See the two papers in *Schweiz-Wochenschrift f. Pharmacie*, 1882, p. 497, and 1883, p. 2.

† See the memoir in *Fresenius, Zeitschr. f. analyt. Chemie*, 1874, I.

‡ See: *Wittstein*, *Viertelj. Schrift f. prakt. Pharm.*, 1869, ii; *Berichte d. deutschen chem. ges.*, 1869, p. 730, and 1870, p. 21.

§ See: *Archiv der Pharmacie*, 238 (1900), p. 42, and p. 279.

|| *Léger* (*Comp. rend. de l'académie française*, 2 Juillet, 1900), has shown that only "Isobarbaloin" contained in the commercial barbaloin, produces the red coloration of Klunge's aloin reactions, see my observations on "Natal Aloin," later on.

ored oxidation product is formed in the following cases, according to our actual knowledge.

1. By the action of cupric salts together with soluble cyanides, sulphocyanides, ferrocyanides and nitroprussiates with inorganic or organic radicals. The action is the same with the cyanic copper compounds, which can be precipitated from copper solution by the above said salts, the copper sulphocyanide especially acting directly and with great energy on aloin solution.

2. By the addition to aloin solutions of cupric salts and even small quantities of soluble haloid salts, the aloin-red formed in that case proving especially stable; also by addition of a little hydrogen peroxide to a warmed solution of aloin containing some cupric salt. This latter reaction might perhaps belong to the category 4 (see below).

3. By the action of a number of directly oxidizing agents on aloin solution, as for instance of peroxides of manganese, lead and some other metals, of permanganates, ferricyanides, nitrous acid, iodine and many other chemical bodies. It should be mentioned, that in these oxidations the purple-red coloration is effected very slowly by the contact of insoluble bodies like PbO_2 with aqueous solutions, much more rapidly and easily with alcoholic solutions.

4. By the action of hydrogen peroxide in the presence of bodies acting as "carriers of oxygen" (according to *Schönbein's* nomenclature), as for instance, certain enzymes or ferments, defibrinated blood, etc.* By means of these experiments upon oxidation of aloin, viz., formation of aloin-red, the observations of *Klunge* could be fully confirmed, namely, that for detection of blood or its coloring matter aloin solution together with hydrogen peroxide or oxidized oil of turpentine can be used with quite the same success as the guaiac solution.

5. Finally a formation of aloin-red takes place in aloin solutions by spontaneous oxidation, viz., by spontaneous attraction of atmospheric oxygen, when the solutions stand in contact with air during a certain time, especially at a somewhat higher temperature. In this case the same violet tint is gradually but slowly developed, which the above-mentioned agents produce in a much shorter period. This spontaneous oxidation and reddening is visibly accelerated, when the aloin solution is agitated with air after addition of a small quantity of mercury or of colloidal platinum solution, prepared by the action of the electric arc-light on platinum electrodes.

The above-mentioned facts prove a very close analogy between the behavior of guaiac solution and aloin solution towards a great number of

* It ought to be mentioned, that also in these reactions the hydrocyanic acid, which *Schönbein* in his last years had shown to weaken or even to impede the specific actions of ferments, very distinctly interferes with the "oxygen-transporting" influence in a mixture of aloin solution and hydric peroxide containing the said bodies.

oxidizing agents, namely, the different cupric compounds, the very changeable guaiac-blue being formed in the one case and the scarcely more stable aloïn-red in the other. Yet a few differences may be observed concerning the oxidation of guaiac resin (guaiaconic acid) and of aloïn (barbaloin, *i. e.*, isobarbaloin and also natalaloin). While, to mention but one fact, guaiac solution is directly colored blue by copper salts, which are not dissolved in several thousand parts of water,* in the cold and much more quickly by warming, the said salts will alter the aloïn solution only at a higher temperature, *not in the cold*, in which case only the yellow color of the aloïn solution is somewhat increased and takes a saffron tint. Besides a further difference between guaiac-blue and aloïn-red is shown by the fact, that the first may be easily extracted from its hydroalcoholic solutions by several liquids, as for instance, chloroform, while this is scarcely possible with solutions of aloïn-red, owing to the difficult solubility or insolubility of the latter in chloroform, and also in ether, tetrachloride of carbon, etc.

As regards the preparation of aloïn-red this product has separated on one single occasion under conditions not realized thereafter from a hydroalcoholic solution, as an amorphous pasty mass of dark purple-red color, which, after adulteration, proved soluble in the specific solvents of aloïn-red. It may be obtained in a purer state by precipitating with ether or benzene the dark purple-violet solution obtained by oxidation by a metallic peroxide of aloïn in ethyl or methyl alcohol. The aloïn-red then separates as an amorphous precipitate of carmine-red color with a violet tint, which may be further purified by repeating the operation.

Aloïn-red is soluble with dark raspberry color in methyl or ethyl alcohol, also in ammonia water and very readily in a concentrated solution of chloral hydrate (65–80 per cent.); the last named solution proving remarkably stable. Moreover the red product is scarcely soluble, and even insoluble in chloroform, carbon tetrachloride, ether, benzene, carbon disulphide, petroleum ether. Its solutions are relatively stable toward acids, but are rapidly changed by fixed alkalies. A very similar change takes place spontaneously in aqueous aloïn-red solutions without addition of acids or alkalies. Upon longer standing, and especially when gently warmed, the dark red solutions of aloïn-red lose their color and become turbid, a yellow precipitate being formed which in the chief points agrees with the substance "alochrysine," described by *Oesterle*,† and which can be obtained from aloïn by the action of energetic oxidizing agents, as for instance chromic acid. It scarcely admits of a doubt that in the spontaneous change of aloïn-red this compound, which shows the character

* The copper salts of organic acids act more strongly and at a higher dilution than the inorganic salts.

† See *Archiv. der Pharmacie*, 1899, p. 81.

of an "ozonide," viz., contains some oxygen in a state of loose combinations, is transformed into a more stable compound of firmer union with oxygen.

As regards this reduction of aloin-red, it is to be expected that a chemical body formed by the influence of active oxygen and therefore behaving as an "ozonide," like guaiac-blue, will be changed and decolorized by such inorganic or organic reducing agents as reduce other ozonides. In fact, the same substances which decolorize guaiac-blue by reduction, also change aloin-red, although this latter body seems to show a greater resistance. Among reducing agents acting on aloin-red sulphur compounds may be first named, as for instance, hydrogen sulphide, sulphurous and hydrosulphurous acids; further some metals like zinc, iron, tin and several of their salts, also peroxide of hydrogen or of barium (in presence of acetic acid), finally numerous derivatives of benzene (aniline, hydroquinone, brasiline, alphanaphthol, etc.).

All the foregoing observations on guaiac-blue and aloin-red point out a distinct analogy between these two products of oxidation. As the first is formed from guaiaconic acid, aloin-red takes its source from aloin under conditions which betray the action of "mobile" oxygen in a state analogous to that of ozone. Like guaiac-blue, aloin-red is marked by deep color and intense coloring power; both compounds are very prone to reduction under similar conditions and are possibly reduced to the original bodies. Lastly, both substances in their solutions are spontaneously decolorized and transformed into more stable oxidation products.

We may therefore assert that the genesis and the qualities of aloin-red and guaiac-blue, not to speak of many other more recent observations, seem to support the opinion repeatedly expressed by Schoenhein, namely, that numerous oxidation processes, either so-called spontaneous oxidations or actions of oxidizing agents, are performed in several successive stages, in which, by influence of active oxygen, certain intermediate products of rather unstable character are first formed and pass over, later on, to the more stable final oxidation products.

In conclusion, I beg leave briefly to point out the most important reactions which are connected with the formation of aloin-red, and which may be used in practical chemical analysis. The formation of aloin-red can be applied:

1. To the detection of aloes, *i. e.*, aloin, often necessary in the examination of medicinals, arcanums and beverages, the reaction being more sensitive and characteristic than the aloes reaction of *Bornträger*, which is observed with a rather large number of derivatives of anthraquinone (chrysophanic acid, emodin, etc.), according to the observations of *Tschirch*. Owing to the dark color of aloes solutions or other mixtures containing this drug, it is necessary to extract the aloin by convenient solvents or by the new "perforation method" and to add to the hydro-alcoholic solution small quantities of a cupric salt and of hydrocyanic acid or a haloid salt.

2. For the detection of the presence of different cyanic compounds and of haloid salts, especially of hydrocyanic acid contained in distillates. The purple coloration appearing after addition of a weak aloin solution and a diluted cupric salt solution is quite as sensitive as the guaiac reaction (formation of guaiac-blue) which takes place under the same conditions.

3. For the detection of free ammonia, for instance, in air or in distillates, in which cases the reaction proves quite as sensitive as the ammonia test of *Nessler*. A blank experiment should be made with pure aloin solution, in order to avoid confusion with some oxidizing agent that might be present in the air or other body which is to be brought in contact with the mixture of aloin solution and cupric salt.

4. For the detection of copper, in the form of cupric salts, which even in the smallest quantities effect the formation of aloin-red in the presence of cyanic compounds, sulphocyanates, ammonia or haloid salts. It has already been observed by *Klunge* that the very frequent simultaneous presence of small quantities of copper and hydrocyanic acid in cherry brandy and similar liquids may also be detected by the addition of aloin. As a further evidence of the sensitiveness of the reaction, the fact may be stated that it has been possible to detect the presence of copper in several vegetable drugs, like styrchnos seeds and cantharides, which after incineration did not betray this metal by the ordinary tests.

5. For the detection of "activating" organic substances able to carry oxygen, like certain ferments, and especially the hemoglobin and hematin contained in blood stains. It is known that the coloring matter of blood is capable of blueing a mixture of guaiac tincture and hydrogen peroxide or "ozonized" turpentine oil; under the same conditions these bodies also cause the formation of aloin-red by increasing the chemical activity of the oxygen contained in the peroxide or in the insolated turpentine oil. Like the guaiac reaction the aloin reaction may also be used as a check reaction (with the precautions mentioned in my paper, *Archiv der Pharmacie*, 236, 1898, p. 571) in many cases, where other methods for detection of blood present special difficulties.

Finally, it should be remembered that blotting paper impregnated with an aloin solution containing some copper salt, can be used for the same purpose as strips of paper prepared with guaiac resin and copper salt.

{ *Pharmaceutical Institute, University.*
{ *Strassburg, Germany, July, 1902.*

Applause greeted the presentation of the paper in abstract.

THE CHAIRMAN: Gentlemen, you have heard this excellent paper from our honorary member, Dr. Schaer. What shall be done with it?

Mr. Anderson moved to receive and refer for publication.

MR. ECCLES: With the thanks of the Association.

MR. LLOYD: Using this paper as the basis of a few remarks, I want to call the attention of the Section to the fact that not a great while ago I received a letter from Prof. Schaer, in which he asked me if I could find in the literature at my command a thesis written in Philadelphia at the beginning of the last century on the subject of chloroform, which he had gotten track of in Germany, and which, if it could be found, would ante-date any use of chloroform in medicine as now recorded. That thesis was presented, according to Prof. Schaer, to the University of Pennsylvania, but owing to the lack of method in keeping theses in those days it was misplaced or lost, and the failure to find it has probably robbed the city of Philadelphia, and the University of Pennsylvania, and the young man who wrote the thesis, of the credit of having first introduced this substance into medicine.

The motion to refer the paper to the Publication Committee, with thanks to the writer, was then carried.

THE CHAIRMAN: The two papers just read were from honorary members. We have two more papers from foreign members, one by Dr. Power on "The Chemistry of the Stem of *Derris Uliginosa*," and the other by Dr. Perrédès on the anatomy of the stem of this plant. Dr. Power has requested that Mr. Caspari kindly read abstracts of these papers before the Association.

MR. CASPARI: The first paper is a special contribution by Dr. Power, who we all know is an active member of this Association. His paper is upon the chemistry of the stem of the plant, while that of his associate, Dr. Perrédès, is a study of the anatomy of the stem. This plant was first brought to the attention of Dr. Power by a retired English naval officer, who brought him specimens from the Fiji Islands.

Mr. Caspari then presented the first paper in abstract, its complete text being as follows:

THE CHEMISTRY OF THE STEM OF DERRIS ULIGINOSA, *BENTH.*

AN EASTERN FISH POISON.

BY FREDERICK B. POWER, PH. D.

Introductory.

The number of plants, or parts of plants, which are used in various countries for the purpose of stupefying or killing fish, and are therefore designated as "fish poisons," is very considerable. Greshoff, in his work entitled: *Mededeelingen uit's Lands Plantentuin*, x, 1893, has described more than two hundred such plants, and quite a number of others have since been brought to notice. Although the plants of this character belong to a variety of natural orders, they appear to be most largely represented by the *Leguminosæ*, *Euphorbiaceæ*, and *Sapindaceæ*. The nature of the substances to which the poisonous action has been attributed is likewise extremely variable, although as yet they have been, for the most part, very incompletely investigated. Many of the plants in question contain substances belonging to the group of saponins, whilst some are assumed to owe their activity to other glucosides, to alkaloids and so.

called bitter principles (such as picrotoxin), or to resins, volatile oils, the production of hydrocyanic acid, etc. Compare, for example, Watts' *Dictionary of the Economic Products of India*, Vol. vi., Part 1, p. 312; Greshoff, *Ber. d. deutsch. Chem. Ges.*, 1890, 23, p. 3538, and *Pharm. Journ.*, 1890, p. 559; Pool, *Chem. Centralblatt*, 1898, i., p. 520; Sillevoldt, *Archiv der Pharm.*, 1899, p. 595; Schaer, *Chem. Zeitung*, 1901, p. 922; Rosenthaler, *Archiv der Pharm.*, 1902, p. 57.)

One of the most recent observations relating to the use of a plant as a fish poison is embodied in a paper by H. M. Kyle, communicated to the Royal Society, December 12, 1901, and reported in *Nature*, May 8, 1902, entitled: "On the action of the Spurge (*Euphorbia hiberna*, L.) on Salmonoid Fishes." These observations are of considerable interest, especially in connection with the views of the author respecting the constituent of the plant to which the poisonous action on fishes is attributed, and on account of their bearing upon the subject of this investigation the brief report referred to may be quoted:

"It has been known for some years that the Irish peasantry employed a simple method of procuring salmon and trout through the agency of the Spurge (*E. hiberna*, L.). The plant cut into small pieces and pounded with stones, or simply trampled upon at some convenient spot on a river, forms an emulsion in the water which, being swept downward into the pools, carries death to all fishes in its course. The fatality thus produced seems to have been enormous—80 to 100 salmon are reported to have been killed at one time, and again in the Bandon rivers 500 to 1,000 fish of various descriptions are said to have been poisoned during one season. In the light of the experiments to be recorded presently, these statements do not seem exaggerated, for the Spurge-extract, even in small quantities, is almost as fatal to fishes as corrosive sublimate."

"The fatal effect of the Spurge on fishes has been known in other countries besides Ireland, but to what ingredient or ingredients of the plant these effects are due seems never to have been investigated. The experiments described in the present paper throw considerable light upon the action of the Spurge, and open out to view some interesting problems."

"Chemical analysis of the Spurge-extract shows that it contains tannic acid. Experiments on the circulation in the lung and mesentery of the frog reveal a close similarity between the action of the Spurge-extract and of tannic acid. In the case of trout the similarity extends to the non-recovery of the fish in fresh water, after they have come under the influence of either Spurge-extract or tannic acid. The power of the Spurge-extract to produce fatal effects persists for several days without diminution. Twenty per cent. of the fresh extract is fatal within five minutes, whilst 0.01 per cent. takes 4 to 6 hours, and seems to be the smallest percentage which has fatal results.* In the case of fishes, death is considered to ensue from the inflammation of the gills and consequent stasis of the circulation, set up by the action of the tannic-acid component of the Spurge-extract. The fresh extract is calculated roughly to contain about 1 per cent. of tannic acid, but on this calculation the Spurge-extract is fatal within a shorter period than the corresponding quantity of tannic acid. Hence the percentage of tannic acid has been

* *Note.*—The latter statement is ambiguous. A 20 per cent. solution of the extract is probably intended, but the quantity of water to which this was added is also not indicated.—P.

under-estimated, or some other substance or substances in the extract also aid in producing fatal effects."

In this connection the following reference to a similar use of another species of *Euphorbia* is of interest.

"*Euphorbia ocellata* of the Pacific coast is used as an antidote for snake bites, and is said to contain 2.82 per cent. of resin, besides gallo-tannic acid; whilst *E. cremocarpus* of the same region is employed for the purpose of catching fish in still ponds and streams, and is said to contain a volatile oil, besides acid and resin." (*U. S. Dispensatory*, 18th Edit., p. 1651.)

The observation of Kyle is somewhat striking, inasmuch as it is believed to be the first instance in which the poisonous action of a plant on fish has been attributed to the tannic acid it contains. Although this opinion respecting the cause of the toxicity appears to have been to some extent confirmed by experiments with tannic acid itself, it is highly probable, as he has indicated, that the toxic action is at least aided by the presence of other substances, for it is well known that many species of the genus *Euphorbia* are particularly characterized by the acrid resins they contain.

With regard to the class of plants to which the drug forming the subject of this investigation belongs, the following summary of available information may be recorded:

In Watts' *Dictionary of the Economic Products of India*, Vol. iii., p. 80, *Derris* is described as "a genus of arborescent climbers or trees, embracing some 40 species, abundant in India, but according to the *Flora of British India* found 'belting the world' in the tropics."

Very little of an economic nature has been recorded regarding the Indian species, of which the following three are mentioned in the above work:

"*Derris elliptica*, Benth.—According to the Kew Report of 1877, the roots of this plant, steeped in water, afford a useful insecticide for gardening purposes. It is also used to kill fish. The Malays use the bark as one of the ingredients in their *Ipok* arrow-poison. *Derris robusta*, Benth.—The wood of this species may be used for tea boxes. *Derris scandens*, Benth.—The bark affords a coarse rope fibre."

The only species of *Derris* that has hitherto been subjected to any extended chemical examination is the above-mentioned *Derris elliptica*, Benth. This appears to have been first examined in 1890 by Greshoff, whose results were published in the work entitled: "Eerste verslag van het onderzoek naar de plantenstoffen van Ned Indie." A short account of this investigation is given in the *Ber. d. deutsch. Chem. Ges.*, 1890, 23, p. 3538, as also in the *Fourn. Chem. Soc. Abst.*, Vol. 60, p. 335, *Pharm. Fourn.*, December, 1890, p. 559, and *Proc. Amer. Pharm. Assoc.*, 1891, p. 655, from which the following is abstracted:

“The active principle of *Derris elliptica* is an acid resinous body to which the name ‘derrid’ has been given. Crude derrid melts at 61° C., but decomposes when heated to 160° C., giving off an odor resembling that of coumarin. Heated with caustic alkali, it yields salicylic acid and a little protocatechuic acid. It is associated in the root with a brown coloring matter—*derris-red*—derived from the tannin. The crude derrid, of which the root yields about five per cent., consists of a crystalline and an amorphous portion. These were separated by treating the substance with dilute spirit, subsequently with a very dilute alkali, and finally dissolving in chloroform. After distilling off the chloroform, the amorphous residue was heated with absolute alcohol, which afforded, on cooling, yellow acicular crystals, melting at 190° C. with partial decomposition. The amorphous derrid remains in the mother liquor after the separation of the crystals. The exact relation of the crystalline to the amorphous derrid has not yet been determined. Derrid appears to be one of the most powerful fish poisons known. A solution containing only one five-millionth part stupefied gold fishes in a few minutes and killed them within half an hour.”

A more recent examination of the same species of *Derris* has been made by H. E. Th. van Sillevoldt (*Archiv der Pharm.*, 1899, p. 595). The latter investigator describes the method of obtaining the so called “derrid,” which is essentially that given by Greshoff, and, although the substance was obtained only in an amorphous form, it was assigned the formula $C_{33}H_{30}O_{10}$. The crude “derrid” is stated to be accompanied by a substance crystallizing in light yellow needles, which melts at about 214° C., is insoluble in water, very sparingly soluble in cold alcohol, benzol, ether and petroleum ether, more readily in chloroform and acetic ether, and is not poisonous to fish. This crystalline substance is stated to have the formula $C_{33}H_{28}O_9 \cdot \frac{1}{2} H_2O$, and was regarded as an “anhydroderrid.” As a crystalline substance of the same composition was obtained by heating derrid in alcoholic solution with hydrochloric acid, it was assumed that it is thus artificially produced from the derrid, although the yield was but about 25 per cent. of the latter. Having supposed such a relationship to exist between derrid and anhydroderrid, and that the derrid must therefore contain at least two hydroxyl groups, an attempt was made to replace these by acetyl and benzoyl groups respectively, but with negative results. By the application of Zeisel’s method to both derrid and anhydroderrid, results were obtained which led Sillevoldt to the further assumption that both of these substances contain three methoxyl groups. These deductions will be further considered in the experimental part of this paper.

The only chemical examination that has hitherto been made of *Derris uliginosa* appears to be that recorded in the “Pharmacographia Indica,” Vol. i., p. 471, where the following statement occurs:

“A proximate analysis of the bark reveals the presence of a neutral crystalline principle, a wax and two resins in the ether extract; two coloring matters, an alkaloid and glucose in the alcoholic extract; an acrid glucoside allied to saponin, together with gum in the aqueous extract, and eight per cent. of mineral matter.”

But little further information is given in the above work regarding these substances, and no reference is given to any other publication comprising experimental details or the methods employed for their separation and identification.

The material for the present investigation was obtained from Mr. F. L. Langdale (Retired Lieutenant, Royal Navy), of Wakaya, Fiji, who had kindly sent a quantity of the drug to Messrs. Burroughs, Wellcome & Co., of London. The botanical characters of the plant, and particularly the anatomy of the stem, have been very thoroughly studied in connection with this investigation by Mr. P. E. F. Perrédès, B. Sc., F. L. S., whose paper on the subject, with illustrations, is contained in the *Proc. Amer. Pharm. Assoc.*, Vol. 50, 1902, p. 321.

In a letter from Mr. Langdale, dated April, 1899, he noted the following observation respecting the action upon fish of this vine, known to the natives of Fiji as "Duva," when crushed and mixed with the enclosed waters of the reef lagoons: "The water after a time turns to a reddish hue and all the fish are killed. The natives use the vine largely for fishing, and although it stupefies or kills the fish it has no bad effects on their flesh."

Experimental.

The following preliminary tests were first made with the drug:

Ten grammes of the ground stem were extracted with Prollius' fluid, but this afforded no indication of the presence of an alkaloid.

Forty grammes of the ground stem were extracted successively with various solvents, when the following percentages of extract, dried at 100° C., were obtained:

Petroleum (b. p. 40-60° C.)	0.373 gm. = 0.93 per cent.
Ether	0.131 gm. = 0.33 per cent.
Chloroform	0.111 gm. = 0.28 per cent.
Alcohol	1.118 gm. = 2.79 per cent.
Total	4.33 per cent.

All of these extracts were dark in color, of a resinous character, and, when treated with acidulated water, none of them gave any reaction for an alkaloid. The statement in the *Pharmacographia Indica*, previously referred to, that this drug contains an alkaloid, could thus not be confirmed, nor was any evidence of such a substance obtained in the subsequent examination of a large quantity of material.

Test for Saponin.—As it is likewise stated in the *Pharmacographia Indica* that the drug contains "an acrid glucoside allied to saponin," a special search was made for a substance of this class, as follows:

Five hundred grammes of the ground stems were extracted with three successive portions of hot water. A dark reddish-brown liquid was

obtained, which frothed considerably on agitation, but the froth was not very persistent. The liquid gave a yellowish color with ferric chloride and was precipitated by lead acetate, but much more abundantly by the basic salt. It slightly reduced Fehling's solution, and to a much greater extent after boiling with an acid. The combined aqueous liquids were evaporated on a water bath to a small bulk, mixed with 50 grammes of magnesia, the mixture completely dried, and extracted in a Soxhlet with strong alcohol. From the alcoholic liquid there separated a considerable amount of colorless, needle-shaped crystals, which were entirely inorganic, and consisted chiefly of potassium nitrate with a little chloride. The alcohol was then distilled off, and the residue taken up with water, which precipitated a little resinous matter. The filtered liquid gave a precipitate with baryta water, which was due, however, to sulphate, and afforded no evidence of the presence of saponin. The frothing of the original aqueous liquid did not appear more strongly marked than in many solutions of vegetable extracts containing *gum*, and a considerable amount of the latter was observed to be present. There is, however, in one of the resins, as will be noted later on, a substance of glucosidal character which produces strong and persistent frothing when shaken with water, and which may be allied to saponin.

Test for Proteid.—As it was thought that the reputed poisonous action of the drug might be due to a proteid, 500 grammes of the ground stems were mixed with 2 liters of water, and allowed to macerate for two days. The filtered liquid, either in its original state or when acidulated, gave no reaction with the usual proteid reagents, and it was therefore evident that no soluble substance of this class was present.

Determination of the Tannin.—With consideration of the interesting observation of Kyle, referred to in the first part of this paper, it seemed desirable to determine the amount of tannin present in the drug. For this purpose the bark alone was used, which in the piece of stem selected was found to correspond to 71 per cent. of the total weight of the latter. The method employed consisted in the repeated percolation of the aqueous extract through hide powder.

Twenty-five grammes of the ground bark were extracted with several successive portions of hot water, and the filtered liquid made up to the measure of 500 Cc. 50 Cc. of this liquid when evaporated, and the resulting extract dried in a steam oven until of constant weight, left a residue weighing 0.5390 gramme. The residue left by 50 Cc. of the liquid after treatment with hide powder, and likewise dried to a constant weight, amounted to 0.3058 gramme. The amount of substance which had combined with the hide powder was therefore 0.2332 gramme, and this would correspond to 9.3 per cent. of tannin in the bark. As the bark constituted 71 per cent. of the total weight of the stem, the amount

of tannic matter in the particular specimen of the latter, assuming the woody portion to be free from tannin, as is apparently the case, would be 6.6 per cent. The tannin is the variety giving a greenish-black color with ferric chloride.

For the more complete examination of the constituents of the drug a larger quantity of material was treated in the following manner:

Three kilos of the ground stems were extracted with hot alcohol, and the alcohol subsequently distilled off, when about 140 grammes, or 4.6 per cent., of a soft, dark-colored extract were obtained. Another lot of the drug, received at a later period, yielded a somewhat smaller amount of extract, namely, 3.3 per cent.

The alcoholic extract was first treated with successive portions of petroleum (b. p. 40–60° C.) until nothing further was dissolved, the liquid filtered, and the petroleum distilled off.

I. EXAMINATION OF THE PETROLEUM EXTRACT.

This extract was an almost black, thick, oily liquid, amounting altogether to 63 grammes. It was brought into a solution of 20 grammes of potassium hydroxide in 200 Cc. of alcohol, and the mixture kept in gentle ebullition for four hours. The alcohol was then distilled off, the alkaline residue diluted with water, and a slight excess of sulphuric acid added, which caused the separation of a considerable amount of light brown, flocculent precipitate. This was collected on a filter, and washed with water. The filtrate and washings were then distilled, when a slightly acid distillate was obtained, which was treated with barium carbonate, and from the solution of the barium salt a very small amount of a silver salt was prepared.

0.0165 gm. of the salt gave, on ignition, 0.008 gm. Ag.

Ag = 48.5 per cent.

$C_6H_{11}O_2$, Ag requires Ag = 48.6 per cent.

This result would indicate the presence of *caproic acid*, but the amount of substance was much too small to afford any further proof of its identity. The liquid remaining from the distillation of the volatile acid was of a light yellow color, and was shaken out with ether, but the latter yielded only a small amount of an oily, reddish-yellow liquid, which could not be further examined.

The precipitate obtained by the addition of sulphuric acid to the product resulting from the saponification of the petroleum extract, as above described, was dissolved in warm alcohol. On cooling, a considerable portion separated out, but as this apparently consisted of a mixture of substances, the following method for their separation was resorted to:

The alcohol was distilled off, and the residue, comprising the whole of the original precipitate, was heated with an aqueous 5 per cent. solution of caustic soda. As the resulting alkaline liquid appeared to contain some uncombined resinous matter which prevented its filtration, it was mixed with clean white sand, evaporated to complete dryness, and extracted in a Soxhlet with petroleum (b. p. 40–60° C.). This removed a considerable amount of a dark-colored substance, the examination of which is described under (b). The residue in the Soxhlet, which would contain all the fatty acids in the form of a soap, was then completely extracted with hot alcohol.

(a) *Identification of the Solid Fatty Acids.*

From the alcoholic solution of the soap just mentioned the alcohol was distilled off, and the residue taken up with water. On acidifying this solution with sulphuric acid a voluminous precipitate was formed, which was dissolved by shaking out the liquid with successive portions of chloroform. The chloroform was then distilled off, and the residue from the latter dissolved in hot alcohol, treated with animal charcoal, and filtered. On standing, a considerable amount of a nearly white, crystalline precipitate separated, which was collected and brought on a porous tile. On recrystallizing from warm petroleum, in which the substance was very sparingly soluble, it was obtained perfectly white. Its melting point was 75° C. Its alcoholic solution was slightly acid to litmus. It was not acted upon by strong nitric acid, nor colored by sulphuric acid. It was analyzed with the following result:

0.1036 gm. gave 0.2928 gm. CO₂ and 0.1206 gm. H₂O.

C = 77.1; H = 12.9 per cent.

C₂₀H₄₀O₂ requires C = 76.9; H = 12.8 per cent.

From the ammonium salt of the acid a silver salt was prepared in the usual manner. This formed a white, amorphous precipitate, which was washed first with water, then with alcohol, and finally dried in a steam oven and analyzed.

0.0988 gm. gave 0.2047 gm. CO₂, 0.0820 gm. H₂O, and 0.0260 gm. Ag.

C = 56.5; H = 9.2; Ag = 26.3 per cent.

C₂₀H₃₀O₂ Ag requires C = 57.3; H = 9.3; Ag = 25.8 per cent.

Another portion of the less pure acid was recrystallized by dissolving it in a very small quantity of warm benzene, and then diluting the solution with petroleum (b. p. 30–40° C.). On allowing the liquid to stand for a few minutes the acid separated in minute glistening crystals, which melted at 74–75° C. This portion of the acid was converted into its silver salt, and the silver determined with the following result:

0.1887 gm. of the salt gave on ignition 0.0488 gm. Ag.

Ag = 25.9 per cent.

$C_{20}H_{39}O_2$ Ag requires Ag = 25.8 per cent.

These results thus indicated that the substance was *arachidic acid*.

For the examination of the mother liquor from which the above mentioned acid was originally obtained, the alcohol was first removed by distillation. The residue was a dark brown semi-solid mass. In order to purify this it was digested on a sand bath with a quantity of 35 per cent. nitric acid for an hour. The cooled mixture was then diluted with water, and the solid acid collected on a filter. It was, however, still too impure to admit of ready crystallization, and the expedient was therefore resorted to of converting it into its amide. This was accomplished by allowing the acid to react on a water bath with an amount of phosphorus trichloride slightly more than that theoretically necessary to convert it into the acid chloride, and then introducing this, drop by drop, into a strong solution of ammonia, kept cool by a freezing mixture. The resulting amide was collected on a filter, and recrystallized from absolute alcohol, from which it separated in a white, crystalline form, having a melting point of 95–96° C. On further crystallization from alcohol its melting point remained unchanged. It was then analyzed with the following result :

(1) 0.1215 gm. gave 0.3382 gm. CO_2 and 0.1442 gm. H_2O .

(2) 0.0757 gm. gave 0.2119 gm. CO_2 and 0.0897 gm. H_2O .

The alcoholic mother liquor from which the above-mentioned amide was obtained still contained a quantity in solution. To this water was added, the precipitate collected on a filter, and recrystallized from absolute alcohol. It then melted at 96–97° C., and was analyzed with the following result :

(3) 0.1003 gm. gave 0.2780 gm. CO_2 and 0.1190 gm. H_2O .

Found (1) C = 75.9; H = 13.2 per cent.

(2) C = 76.3; H = 13.2 per cent.

(3) C = 75.6; H = 13.2 per cent.

$C_{17}H_{35}CONH_2$ requires C = 76.3; H = 13.1 per cent.

These results would thus indicate that the acid remaining in the above-mentioned mother liquor from the arachidic acid was *stearic acid*.

(b) *Identification of the Neutral Constituents of the Petroleum Extract.*

As previously mentioned, the final saponified product, mixed with sand, was first extracted in a Soxhlet with petroleum (b. p. 40–60° C.) in order to separate any non-saponifiable substances from the associated fatty acids which had been converted into their sodium salts. The petroleum,

on standing, deposited a small amount of a crystalline substance. This was recrystallized from absolute alcohol, when it separated in fine white needles, melting at 172° C. On further crystallization from alcohol, and then dissolving in a little warm benzene, with the subsequent addition of petroleum (b. p. $30-40^{\circ}$ C.), there soon separated a small amount of white needle-shaped crystals, which were at once removed from the mother liquor. The melting point of this substance was 80° C., and when recrystallized from glacial acetic acid it still melted at $80-81^{\circ}$ C. After drying for an hour at 115° C. it was analyzed with the following result:

0.0427 gm. gave 0.1273 gm. CO_2 and 0.0550 gm. H_2O .

C = 81.3; H = 14.3 per cent.

$\text{C}_{27}\text{H}_{48}\text{O}$ requires C = 81.8; H = 14.1 per cent.

This substance would therefore appear to be *ceryl alcohol*. (Compare *Fourn. Chem. Soc.*, 1890, 57, p. 197, and 1892, 61, p. 916).

The petroleum mother liquor from the above-mentioned crystalline substance which yielded the ceryl alcohol was distilled in order to remove the petroleum, and the residue taken up with alcohol. There then separated from the alcoholic solution a quantity of a white crystalline substance, and on concentrating the mother liquor from this much more of the same substance was obtained. The final syrupy mother liquor was then diluted with much water, which caused the separation of a semi-solid mass. This was taken up with ether, the ethereal solution washed with water, dried with calcium chloride, and the ether removed by distillation. The residue consisted of a clear, light brown syrup. This was dissolved in warm methylal, and from this solution, after standing for several days, a quantity of crystalline product was obtained. All the crystalline substance thus obtained was then dissolved in absolute alcohol, and to this solution was added the alcoholic mother liquors resulting from the recrystallization of the product which had yielded the above mentioned ceryl alcohol. From this alcoholic solution a fair amount of product was obtained which melted indefinitely between 180° and 194° C., and when digested with a relatively large amount of 90 per cent. alcohol it was observed that a portion remained undissolved. This sparingly soluble portion was collected by the rapid filtration of the hot liquid, and was found to melt at 194° C. The alcoholic filtrate, on cooling, deposited nearly all the substance it contained.

The substance melting at 194° C. was recrystallized from glacial acetic acid. It was then obtained in handsome colorless laminæ, which softened at 205° and melted at 208° C. On again crystallizing from alcohol it formed needles, melting at $207-209^{\circ}$ C. A portion of this substance which had been crystallized from acetic acid, and subsequently allowed

to remain in a vacuum desiccator over potash for the night, was placed in a steam oven for a few minutes. It was then observed that it had quickly lost its previous crystalline lustre, and possessed the odor of acetic acid. This was quite in accordance with the property of cholesterol, which is known to form a loose molecular compound ($C_{26}H_{44}O.C_2H_4O_2$) with acetic acid. (Compare Beilstein's *Handbuch der org. Chemie*, ii., p. 1073.)

This highest melting product was finally crystallized from 90 per cent. alcohol in order to remove any combined acetic acid, and was then analyzed with the following result :

0.1059 gm. gave 0.3247 gm. CO_2 and 0.1120 gm. H_2O .

C = 83.6; H = 11.8 per cent.

$C_{26}H_{44}O$ requires C = 83.9; H = 11.8 per cent.

When a small amount of the substance was dissolved in a little acetic anhydride, and a few drops of concentrated sulphuric acid added, a rose-red coloration was gradually developed, which on standing changed to brown.

The alcoholic filtrate from which the sparingly soluble substance, originally melting at $194^\circ C.$, was obtained, quickly deposited on cooling nearly the entire amount of dissolved substance in the form of white needles melting at 180 to $190^\circ C.$ This was then crystallized several times from glacial acetic acid, but although in the case of the sparingly soluble product the melting point shifted from 194 to $208^\circ C.$ by one crystallization from glacial acetic acid, repeated crystallization of the more freely soluble product from the same solvent failed to raise the melting point above 190 – $192^\circ C.$, and this was not altered by a final crystallization from alcohol. It was therefore to be regarded as a distinct and pure substance, and, like that of higher melting point, it formed a loose compound with acetic acid, as will be seen from the following result. A portion which had been recrystallized from glacial acetic acid, from which it separated in glistening laminæ, was first dried on a porous tile, and then allowed to remain for two days in a desiccator over potash :

0.2877 gm. of the substance so treated, when heated to $115^\circ C.$ until of constant weight, lost 0.0332 gm.

This would correspond to acetic acid = 11.5 per cent.

$C_{26}H_{44}O.C_2H_4O_2$ requires acetic acid = 13.9 per cent.

The amount of combined acid was thus somewhat less than one molecule, a little of the acid having probably become eliminated prior to analysis.

An analysis of the completely dried substance was then made with the following result :

(1) 0.1149 gm. gave 0.3544 gm. CO_2 and 0.1230 gm. H_2O .

A portion of the substance which had been crystallized from glacial acetic acid, and subsequently from alcohol, was also analyzed.

(2) 0.1064 gm. gave 0.3268 gm. CO_2 and 0.1126 gm. H_2O .

Found: (1) C = 84.1; H = 11.9 per cent.

(2) C = 83.8; H = 11.8 per cent.

$\text{C}_{28}\text{H}_{44}\text{O}$ requires C = 83.9; H = 11.8 per cent.

The rotation of the substance in chloroform solution was then determined with the following result:

$$c = 1.961; l = 1 \text{ dcm.}; a_D = +0^\circ 30'. \text{ Hence } [\alpha]_D = +25.5^\circ.$$

The color reaction in acetic anhydride solution with concentrated sulphuric acid was the same as that of the higher melting substance.

It is evident that the two crystalline substances above described belong to the class of *cholesterols*, but the observed differences in solubility and in melting point, which exist even after very careful purification, likewise indicate that they represent well differentiated isomers. They do not correspond precisely in their characters to any of the various vegetable substances of this class that have previously been described (compare Beilstein's *Handbuch der org. Chemie*, ii., p. 1075), but it is quite possible that these discrepancies may be due, in some instances, to varying degrees of purity. (For a description of some substances of a similar character, see *Ber. d. deutsch. chem. Ges.*, 1891, 24, p. 183, and *Fourn. Chem. Soc.*, 1892, 61, p. 916; 1894, 65, p. 867; 1895, 67, p. 1089.)

Some interesting observations relating to the physiological function of cholesterol in the animal body have recently been recorded by Dr. F. Ransom in a paper entitled: "Saponin und sein Gegengift" (*Deutsch. med. Wochenschrift*, 1901, No. 13, p. 194). After noting the fact that Phisalix has attributed to cholesterol, as also to tyrosin, an immunizing action toward snake poison, and that Fraser has also claimed a similar property for the bile of poisonous snakes, the author remarks as follows:

"The function of cholesterol in the animal economy has hitherto not been quite clear. His observations, however, indicate that it plays an important part in building up the erythrocytes, for its removal or change results in the elimination of the hæmoglobin."

In this connection the same author has studied the hæmolytic action of saponin, chiefly on dogs' blood, and states:

"If, for the purpose of the investigation, the red blood corpuscles be considered as small living masses of protoplasm floating in a dilute serum, it is found that two milligrammes of saponin represent about the minimum lethal dose for the number of these small living bodies contained in 0.7 Cc. of dog's blood. There exists a kind of affinity or relation of solubility between saponin and cholesterol whereby it is possible for the former

(saponin) to act as a poison upon tissues containing the latter (cholesterol), but that the latter, under certain circumstances, acts as a protective against the former. So far as the investigation has as yet proceeded, it is found that cholesterol is only active toward actual saponin and the members of the saponin group, and perhaps not toward all of these. Toward other hæmolysines of vegetable origin, as also toward the hæmolytic action of foreign sera, it is, so far as has been tested, quite incapable of affording protection. By the discovery of the relation of cholesterol to the saponin hæmolysis, it has been possible for the first time to isolate, in a state of purity, directly from the tissue attacked by the toxin, the substance which forms the point of attack for the toxin, and at the same time to demonstrate that the same substance may, and actually does, serve as a protective agent."

The observations of Ransom appear to suggest some further inquiries which may be found worthy of investigation, the first and most important of which pertains to the physiological function of the cholesterols occurring in plants. It is interesting, for example, to note in connection with the statement that cholesterol has an immunizing action toward snake poison, that, as mentioned in the introductory part of this paper, of the two closely related species of *Euphorbia* of the Pacific coast—*E. ocellata* and *E. cremocarpus*—the former, although not known to contain cholesterol, is reputed to act as an antidote to snake poison, whereas the latter is used for killing fish. On the other hand it is well known that a large number of plants used as fish poisons contain saponin, whilst the species of *Derris* under examination, which is also used as a fish poison, has been shown to contain a not inconsiderable amount of isomers of cholesterol. It seems not unlikely that some points of interest, at least in their relation to plant physiology, may be associated with these facts.

II. EXAMINATION OF THE RESINS.

As previously stated, the original alcoholic extract of the drug was first extracted with petroleum of low boiling point. The portion insoluble in the latter was then redissolved in alcohol, and the concentrated solution poured into water in order to precipitate the resin.

The aqueous liquid, filtered from the resin, was concentrated by evaporation. It then afforded no reaction for an alkaloid, thus confirming the previous conclusion that no substance of this class is present in the drug. It contained a considerable amount of *tannin* and *coloring matter*, which were precipitated by lead acetate, but the examination of this precipitate or the filtrate therefrom afforded no substance of special interest. The filtrate contained some *sugar*, which strongly reduced Fehling's solution, and when evaporated and subsequently extracted with alcohol the latter solution, on standing, deposited some crystals of *potassium nitrate*. This inorganic salt appears to be present in relatively large amount in the drug.

The precipitated resin above mentioned formed a flocculent, brown precipitate, which was collected on a filter, washed with water, and dried.

It was then brought into a Soxhlet, and completely extracted with chloroform. After distilling off the chloroform the portion of resin that had been dissolved by the latter was found to represent 57.3 per cent. of the whole amount. The undissolved portion, remaining in the Soxhlet, was then extracted with alcohol, the solution concentrated, poured into water, and the precipitated resin collected on a filter, washed with water, and dried. The original resin had thus been resolved into a portion soluble in chloroform, and a portion insoluble in the latter liquid, both of which were separately examined.

1. *Resin Soluble in Chloroform.*

As the alcoholic solution of this resin when added to water formed a soft, sticky mass, it was obtained, after distilling off the chloroform and drying the residue in a water oven, in the form of dark brown scales or fragments, which, when cold, could be reduced to a brown powder.

It contains no nitrogen, and left no ash on ignition. It is quite readily soluble in most of the organic solvents, including glacial acetic acid, but showed no distinct tendency to crystallize from any of these liquids. It was also dissolved to a considerable extent by a 5 per cent. solution of caustic soda, and less readily by a 10 per cent. solution of sodium carbonate, forming yellowish or reddish-yellow solutions. Its alcoholic solution gives a brownish-black color with ferric chloride, and is precipitated by alcoholic solutions of lead acetate and copper acetate, but gives no precipitate with tannic acid. When heated with acetic anhydride and sodium acetate it was not acetylated. A portion of the resin was boiled for an hour with 5 per cent. sulphuric acid, and the acid then removed by digesting with barium carbonate. The filtered liquid had not the slightest reducing action on Fehling's solution, which indicated that this resin is not a glucoside.

Action of Hydrochloric Acid in Alcoholic Solution.

The portion of resin soluble in chloroform appears to be analogous in character to the resinous substance obtained by Greshoff (*loc. cit.*) by a slightly different method from the root of *Derris elliptica*, to which the name of "derrid" has been given, and which is stated to be accompanied by a crystalline substance. A more recent study of "derrid" has been made by Sillevoldt (*loc. cit.*), who, although having obtained it only in an amorphous form, has assigned to it the formula $C_{33}H_{30}O_{10}$, and to the crystalline substance accompanying it, which he regarded as an "anhydroderrid," the formula $C_{33}H_{28}O_9$. As the same crystalline substance was obtained from "derrid" by the action of hydrochloric acid in alcoholic solution, it was assumed to have been produced from it by the action of the acid. The correctness of the formula assigned to "derrid" was,

moreover, believed to have been confirmed by the formation of the "anhydroderrid," and by the determination of the methoxyl groups, as it was thus indicated that three such groups are contained in the molecule of both these substances. No molecular weight determination of the crystalline substance appears, however, to have been made, and as there was no direct evidence of the purity of the amorphous "derrid" the deductions made by Sillevoldt from his experiments would hardly seem to be justified.

In view of the above observations it seemed of interest to ascertain whether a similar crystalline substance could be obtained from the portion of resin extracted from *Derris uliginosa*.

Five grammes of the resin were dissolved in 250 Cc. of alcohol, 25 Cc. of hydrochloric acid (sp. grav. 1.115) added, and the mixture heated on a water bath in a flask with inverted condenser for two hours. The liquid became darker in color, and on cooling it was observed that some amorphous resinous matter was suspended in it, while a few small needle-shaped crystals had separated on the sides of the flask. The mixture was filtered at the pump, the separated substance washed with a little alcohol, and brought on a porous tile. On drying, however, it was found to consist chiefly of amorphous matter, and being too impure for further examination it was finally discarded. From the filtered acid liquid the alcohol was distilled off, a quantity of ether added, and subsequently water, which caused the separation of a considerable amount of hard, dark brown resin, which did not dissolve in the ether and was not further examined. The ethereal layer, however, was separated, washed well with water, dried with calcium chloride, and the ether removed. The residue was chiefly a varnish, but was seen to contain some embedded crystalline substance. The whole was therefore digested with a small quantity of absolute alcohol, which dissolved a dark resinous matter, and after filtration there remained on the filter a greenish-yellow granular substance. This was dissolved in a large amount of hot absolute alcohol, the solution boiled with animal charcoal, filtered, and allowed to cool, when a crop of greenish-yellow needles was obtained. The melting point of this substance was $212-213^{\circ}$ C. It was recrystallized by dissolving in a little chloroform, in which it is very readily soluble, and then adding alcohol. The substance then separated almost immediately in fine sulphur-yellow needles, the melting point of which was the same as before. It was quite insoluble in alkalies, even on warming, and its alcoholic solution gave no coloration with ferric chloride. On analysis it gave the following results:

(1) 0.0956 gm. gave 0.2387 gm. CO_2 and 0.0447 gm. H_2O .

(2) 0.0369 gm. gave 0.0926 gm. CO_2 and 0.0196 gm. H_2O .

(1) C = 68.1; H = 5.2 per cent.

(2) C = 68.4; H = 5.9 per cent.

Although this substance has the same melting point, and appears otherwise to correspond in its physical properties with the "anhydroderrid" described by Sillevoldt (*loc. cit.*), the figures obtained by its analysis are somewhat at variance with his results. It may indeed be considered doubtful whether this substance is actually formed by the action of the hydrochloric acid, for Sillevoldt has found some of the so-called "anhydroderrid" to pre-exist in the resin examined by him, and it is quite possible that the action of the acid simply consists in so changing the character of the amorphous resin as to render the substance associated with it more readily crystallizable. With the hope of obtaining a larger amount of this crystalline substance, and subjecting it to a more complete examination, a decision respecting even its empirical formula may properly be deferred.

The aqueous acid liquid remaining after the extraction of the crystalline substance by ether was concentrated, neutralized and tested for sugar, but with a negative result. This therefore confirms the result obtained by the action of aqueous acid on this resin, and also proves that the crystalline substance is not a hydrolytic product of a glucoside.

Fusion with Potash.

Fifty grammes of caustic potash were dissolved in 50 Cc. of water in a silver dish, and the solution heated. Ten grammes of the resin were then introduced. It immediately melted, but did not at once dissolve. The heating was continued with a gradual increase of temperature to 200° C. The still undissolved resin then began to react with the caustic potash, frothing ensued, and by maintaining a temperature of 230 to 240° C. for some time, a thick, chocolate-colored homogeneous paste was obtained. This was dissolved in about 300 Cc. of water, the solution acidified with sulphuric acid, and subjected to steam distillation until the distillate no longer had an acid reaction.

The liquid remaining in the distillation flask was cooled, and filtered from a mass of pitch-like substance. The acid filtrate was extracted five times with ether, the ethereal liquid washed once with a little water, dried with calcium chloride, and the ether distilled off, when a very small amount of a brown syrup was obtained. This was purified by digesting with boiling water and treating with animal charcoal, but from the resulting liquid no crystalline product could be obtained. It was observed, however, to give a violet coloration with ferric chloride.

A second portion of 10 grammes of resin was then fused with 75 grammes of caustic potash dissolved in 50 Cc. of water, the operation being conducted as before, but in this case the temperature was allowed to rise to 270–280° C., and was maintained at that point for an hour. After dissolving the mass in water, and acidifying with sulphuric acid, the

volatile acids were distilled off, and the residual liquid in the flask treated as before described. In this case also no crystalline product could be obtained.

As noted in the introductory part of this paper, it is recorded that by heating the so-called "derrid" with caustic alkali, Greshoff obtained salicylic and protocatechuic acids. It must remain for the present undecided whether in the case of the resin under examination the violet coloration with ferric chloride is due to the production of salicylic acid or to a phenol. As will be shown later on, the portion of resin which is insoluble in chloroform affords protocatechuic acid on fusion with potash.

The distillates from the acidified solutions of the two potash fusions were combined, made alkaline with sodium carbonate, and the liquid evaporated to a paste. This was acidified with sulphuric acid, and shaken out five times with ether. The ethereal liquid was washed once with a little water, dried with calcium chloride, and the ether removed. The residue was a light brown oil, having an odor reminding of valerianic and acetic acids, and weighed 2.4 grammes. It was converted into a barium salt, and from this a silver salt was prepared, which was washed with a considerable amount of water. The silver salt which remained on the filter was dried and analyzed.

0.0302 gm. of the salt gave on ignition 0.0152 gm. Ag.

Ag = 50.3 per cent.

$C_8H_5O_2$ Ag requires Ag = 51.7 per cent.

The filtrate and washings from this salt were concentrated by evaporation, when two silver salts were collected as they separated during the process of concentration. They were dried and analyzed.

(1) 0.1932 gm. of the salt gave on ignition 0.1194 gm. Ag.

(2) 0.1578 gm. of the salt gave on ignition 0.0992 gm. Ag.

Found (1) Ag = 61.8 per cent.

(2) Ag = 62.9 per cent.

$C_8H_5O_2$ Ag requires Ag = 64.1 per cent.

The volatile acids formed by the fusion of this resin with potash were therefore evidently *valerianic* and *acetic acids*.

Oxidation with Nitric Acid.

Fifteen grammes of the resin with 150 Cc. of 35 per cent. nitric acid were heated to boiling on a sand bath in a flask connected with an inverted condenser for about 8 hours. As oxidation took place the greater part of the resin entered into solution. After several hours boiling the mixture consisted of a clear light yellow fluid with a thin layer of a yellow oil floating on the surface, which did not oxidize further by more prolonged boiling. On cooling, the oily layer became a hard crust. The liquid

was filtered, the solid substance spread on a porous tile to dry, and the filtrate set aside for further examination. By repeated crystallization from acetone the solid substance was obtained, in part, in the form of small, white crystals, melting at 75–76° C. It contained no nitrogen, and was an acid. The amount of the substance obtained in a pure state was very small, being only 0.3 gramme, but it was evident that much was necessarily lost during the somewhat tedious separation from the uncrySTALLIZABLE matter of which the original solid substance chiefly consisted. The acid was analyzed with the following result :

(1) 0.0920 gm. gave 0.2607 gm. CO₂ and 0.1073 gm. H₂O.

(2) 0.0340 gm. gave 0.0959 gm. CO₂ and 0.0402 gm. H₂O.

Found (1) C = 77.3; H = 13.0 per cent.

(2) C = 77.0; H = 13.1 per cent.

C₂₂H₄₄O₂ requires C = 77.6; H = 12.9 per cent.

The substance would thus appear to be *behenic acid*, the melting point of which has been given as 77–78° C. With consideration, however, of this being an open-chain acid of 22 carbon atoms, it seems very improbable that it is a product of oxidation, but is more likely to have pre-existed in the resin, possibly in the form of an ester, and to have been separated by the oxidation of substances associated with it. The correctness of this view is supported by the following subsequent experiment, which also served to indicate the complex composition of the portion of resin soluble in chloroform.

A portion of the resin, for example, was dissolved in ether, and the solution shaken first with several successive portions of a 10 per cent. solution of sodium carbonate and afterwards with a 5 per cent. solution of caustic soda. Both of these liquids were very deeply colored. They were separately acidified with sulphuric acid, which precipitated resinous matter that was taken up by ether, and by the evaporation of the ethereal liquids both of them afforded a dark colored varnish. The original ether solution of the resin from which nothing appreciable was further extracted by the aqueous alkali was relatively light in color. It was washed with water, and the ether removed, when a residue was obtained amounting to nearly 50 per cent. of the original resin. It was dissolved in warm alcohol, and on cooling a mass of indistinctly crystalline matter separated. The entire liquid was then heated for some time with caustic potash, the alcohol distilled off, a little water added, and the strongly alkaline solution shaken out with ether. The latter on evaporation left a residue which, when dissolved in glacial acetic acid, formed a gelatinous mass. The remaining alkaline liquid was then acidified with sulphuric acid, and shaken out with ether. The ethereal liquid left a residue having an odor reminding of fatty acids, and which dissolved in sodium carbonate.

These constituent products of the resin were not, however, obtained in sufficient amount for a separate examination.

The nitric acid filtrate from the solid substance which yielded the behenic acid was evaporated on a water bath, with successive additions of water during the operation. The concentrated liquid, on cooling, deposited a quantity of a crystalline substance. This was collected, and dissolved in hot water, in which it was very sparingly soluble, and on cooling a pale yellow crystalline substance was obtained. The mother liquor from the latter afforded on evaporation a crystalline residue consisting entirely of *oxalic acid*. The sparingly soluble substance was recrystallized from much water, and was found to contain nitrogen. It was readily soluble in ammonia and in alkali carbonates, forming solutions of a light yellow color. When dried at 115° C. it melted at $170-172^{\circ}$ C., and on analysis gave the following results:

(1) 0.1176 gm. gave 0.1335 gm. CO_2 and 0.0195 gm. H_2O .

(2) 0.0461 gm. gave 0.0522 gm. CO_2 and 0.0096 gm. H_2O .

(1) C = 30.9; H = 1.8 per cent.

(2) C = 30.8; H = 2.3 per cent.

0.1089 gm. gave 15.8 Cc. of moist nitrogen at 758 Mm. and 20° C.

N = 16.6 per cent.

Although from these results an empirical formula has been calculated for the substance, it has not been possible to identify it. It is the intention, when a larger amount of material can be obtained, to subject it to a more complete study.

2. *Resin Insoluble in Chloroform.*

This was obtained by the precipitation of its concentrated alcoholic solution with water in the form of a chocolate-brown powder. It contains no nitrogen. On ignition it left a small amount of ash. It was fairly soluble in ethyl acetate, acetone, and glacial acetic acid, but showed no tendency to crystallize from these liquids. It was also almost completely dissolved by a 5 per cent. solution of caustic soda, and by a 10 per cent. solution of sodium carbonate, forming dark brown solutions. Its alcoholic solution gives a deep greenish color with ferric chloride, and is precipitated by alcoholic solutions of lead acetate and copper acetate, but gives no precipitate with tannic acid.

Hydrolysis of the Resin.

One gramme of the resin was first heated with 25 Cc. of water for an hour. The liquid frothed considerably, and an aromatic odor was developed, but after filtration it had no reducing action on Fehling's solution. On subsequently heating the residual resin with 5 per cent. sulphuric acid, and removing the acid by barium carbonate, the filtered liquid

abundantly reduced Fehling's solution, thus indicating the presence of a *glucoside*.

Five grammes of the resin were then boiled for about 3 hours with 100 Cc. of 5 per cent. sulphuric acid. The filtered liquid, which was of a bright red color, was shaken out several times with ether. On removing the ether a very slight amorphous residue was obtained, the aqueous solution of which gave an olive-green color with ferric chloride. The acid liquid was then digested with barium carbonate until rendered perfectly neutral to test-paper, filtered, and diluted with water to the measure of 100 Cc. It was then of a pale yellow color, and the amount of sugar contained therein was quantitatively determined.

For the reduction of 10 Cc. of Fehling's solution 13.5 Cc. of the above liquid were required. The total amount of sugar in the 100 Cc., calculated as glucose, was therefore 0.37 gramme. The density of the solution was practically 1. Its rotation in a 100 mm. tube was $+ 0^{\circ} 13'$. From these data the specific rotation of the sugar could be calculated with approximate accuracy, and was found to be $[\alpha]_D = + 58.5^{\circ}$. The specific rotation of *D* glucose is accepted as $[\alpha]_D = + 52.5^{\circ}$. From a portion of the liquid an osazone was prepared, which, when recrystallized from alcohol, melted at 201° C. The sugar obtained by the hydrolysis was therefore evidently *D* glucose. On the slow evaporation of its solution it formed a pale yellow syrup.

The substance remaining from the hydrolysis of the 5 grammes of resin was but little altered in appearance, and when washed and dried weighed 4.3 grammes. It was then mixed with clean sand and extracted in a Soxhlet with chloroform. A small amount of substance was thus extracted, which was evidently a product of hydrolysis, as the original resin was quite insoluble in chloroform. On allowing this liquid to evaporate, the residue was observed to contain a few crystals. It was redissolved in a little alcohol, and by this treatment a very small amount of a substance was obtained which crystallized in colorless, micaceous scales, and melted at about 230° C. It gave no coloration with ferric chloride, and was too small in amount for further examination.

The resin remaining in the Soxhlet was then extracted with alcohol. To the very dark colored liquid 1 Cc. of hydrochloric acid, sp. gr. 1.16, was added, and the mixture boiled for 2 hours. The concentrated liquid was then poured into water to precipitate the resin, and filtered. After neutralization it did not reduce Fehling's solution, thus proving that no further hydrolysis had taken place after the action of the aqueous acid. From the comparatively small amount of sugar first obtained it may also be concluded that the glucosidal constituent of the resin which affords it represents but a small proportion of the latter.

Fusion with Potash.

Fifty grammes of caustic potash were dissolved in 50 Cc. of water in a silver dish, the solution heated, and 10 grammes of the resin introduced. On continuing the heat the resin dissolved, and the temperature was allowed to gradually rise to 220° C. It was kept at this point until the melt became a thick paste. This was then dissolved in about 300 Cc. of warm water, the liquid acidified with sulphuric acid and steam distilled.

The distillate, which was practically odorless, had a strongly acid reaction, and sodium carbonate was added until rendered faintly alkaline. It was then evaporated nearly to dryness, acidified with sulphuric acid, and extracted five times with ether. The ethereal solution was washed once with a little water, dried with calcium chloride, and the ether removed. The residue, which weighed 0.8 gramme, was a light brown, pungent-smelling liquid, suggestive of acetic acid. It was converted into its barium salt, and from the latter a silver salt was precipitated in two fractions. These silver salts were nearly white, dissolved readily in hot water, and on cooling separated in a crystalline form. They were analyzed with the following results:

Fraction I. 0.0873 gm. of the salt gave on ignition 0.0535 gm. Ag.

Fraction I. 0.1779 gm. of the salt gave on ignition 0.1097 gm. Ag.

Fraction II. 0.1680 gm. of the salt gave on ignition 0.1068 gm. Ag.

Found—Fraction I. 61.3; 61.6. Fraction II. 63.6 per cent. Ag.

$C_2H_3O_2$ Ag requires 64.1 per cent. Ag.

The volatile acid formed by the fusion was therefore essentially *acetic acid*.

The liquid remaining from the distillation of the volatile acid was extracted five times with ether, the ethereal solution washed once with a little water, dried with calcium chloride, and the ether removed by distillation. The residue was a dark brown syrup. This was poured into about 200 Cc. of boiling water, the mixture digested for half an hour and filtered. The brownish colored filtrate was boiled with animal charcoal, again filtered, and evaporated to a very small bulk. This on cooling became a crystalline paste, which was spread on a porous tile. The substance was then recrystallized from water, from which it separated in nearly colorless needles, having a melting point of 196° C. The aqueous solution of these crystals gave, on the addition of a drop of ferric chloride, a greenish-blue coloration, which was changed to bluish-violet on the subsequent introduction of one drop of sodium carbonate solution, and to blood-red when more of the same reagent was added.

0.1415 gm. of the air-dried substance when heated at 115° C. until of constant weight lost 0.0150 gm., or 10.6 per cent. H_2O .

$C_7H_6O_4 \cdot H_2O$ requires 10.5 per cent. H_2O .

0.1265 gm. of the substance dried at 115° C. gave on analysis 0.2526 gm. CO₂ and 0.0458 gm. H₂O. C = 54.5; H = 4.0 per cent.

C₇H₆O₄ requires C = 54.5; H = 3.9 per cent.

The crystalline substance produced by this fusion was therefore identified as *protocatechuic acid*.

Oxidation with Permanganate.

Five grammes of the resin were dissolved in the cold in a 10 per cent. solution of caustic soda, and a saturated cold solution of potassium permanganate added from time to time as decolorization ensued. This was continued until the red color of the liquid remained permanent for a day. On working up the liquid, however, in the usual way, the only crystalline product that could be isolated was *oxalic acid*.

PHYSIOLOGICAL ACTION OF DERRIS AND ITS RESINS.

The experiments here described were conducted only upon fish.

Ten grammes of the ground bark, free from the woody portion of the stem, were digested with cold water for 24 hours, the dark reddish colored liquid strained, and diluted with water to the measure of 100 Cc.

1. Five Cc. of the above liquid were mixed with 1000 Cc. of water, and a small gold-fish introduced. It seemed at first to be stupefied, but after 15 minutes became more active, and in half an hour appeared to have quite recovered. After remaining for about 2 hours in the liquid, and in the meantime not being further affected, it was then transferred to fresh water, when it continued to remain in a perfectly normal condition for days.

2. The experiment was repeated with a somewhat larger gold-fish, but in this instance 20 Cc. of the above liquid were mixed with 1000 Cc. of water. The fish soon appeared to be stupefied, and after three-quarters of an hour became motionless and sank to the bottom of the vessel. It revived temporarily, but after 3 hours floated on its side on the surface of the water, and was soon dead.

3. In view of the recent statement of Kyle (*loc. cit.*) respecting the toxic action of tannic acid on fish, it seemed of interest to make a comparative experiment with this substance, especially as the bark of Derris is particularly rich in tannin. As the amount of tannin in the bark employed for the preceding experiments was known, a solution of pure tannic acid (Kahlbaum's) of the same calculated strength as the above-mentioned liquid was prepared, that is, 0.93 gramme of tannic acid in 100 Cc. of water. 20 Cc. of this solution were mixed with 1000 Cc. of water and a gold-fish introduced. The water almost immediately became milky throughout, to such an extent finally as to almost completely obscure the fish. This interesting phenomenon was evidently due to something

ejected by the fish, and which possibly reacted with the tannic acid, although the liquid in experiment 2, which contained by calculation the same amount of tannic matter, remained perfectly clear. The fish was at first active, but after half an hour became quite motionless, and remained at the bottom of the vessel. It subsequently revived, and after remaining in the liquid for four hours it was brought into fresh water, when it continued to remain in a perfectly normal condition for days. This considerable amount of tannic acid therefore did not prove destructive to the fish, and its action was in general very different from that produced by the corresponding infusion of Derris.

The action of the two resins obtained from the Derris was now determined. For this purpose solutions were prepared of the same strength as that employed by Sillevoldt (*loc. cit.*) in his experiments with the so-called "derrid" from *Derris elliptica*.

4. *Resin soluble in chloroform.* 0.01 gramme of this resin was dissolved in 5 Cc. of absolute alcohol, and the solution diluted with water to the measure of 100 Cc. 10 Cc. of this dilute and slightly opalescent liquid were mixed with 1000 Cc. of water, and a gold-fish introduced. The fish did not appear to be much affected at first, but in the course of 3 hours it was completely stupefied, and remained motionless when touched. It could not be further observed until the following morning, when it was lying on its side on the surface of the water practically lifeless, and did not revive when brought into fresh water. It will be observed that the amount of substance which produced this effect corresponded to 1 part of the resin in one million parts of water.

5. *Resin insoluble in chloroform.* This resin was tested in precisely the same manner and at the same time as the preceding. The fish, however, was entirely unaffected, even after remaining in the liquid for 24 hours. It was then brought into fresh water, and continued to remain in a perfectly normal condition for days.

Although this last result showed that the amount of alcohol contained in the liquid was not sufficient to produce any action on the fish, yet, for the purpose of control, another gold-fish was allowed to remain during the time of these experiments in a liquid containing the same amount of alcohol as was present in the water containing the resins. It was not in the least affected at any time, and after remaining in the liquid for 24 hours it was brought into fresh water.

The results of the preceding experiments, especially those described under 2 and 4, not only confirm the reputed poisonous action of this species of Derris on fish, but they would also seem to have demonstrated that the stupefying or toxic effect is produced by some constituent of that portion of the resin which is soluble in chloroform, and which is naturally contained in small amount in a cold aqueous infusion of the drug.

The exceedingly small amount of the resin that is required to produce a fatal effect, together with the fact that the original resin had been precipitated with water, and that the active portion had been obtained from this precipitated crude resin by extraction with chloroform, renders it impossible to assume that the tannic acid contained in the drug can play any important part in its action as a fish poison, as the previously mentioned observations of Kyle might otherwise lead one to infer. Moreover, the "derrid" obtained by Sillevoldt from *Derris elliptica* appears to have been even more powerful in its action than the corresponding resin from *Derris uliginosa*, and as he has stated that its alcoholic solution gave no coloration with ferric chloride, it could not have contained any tannin.

Summary and Conclusions.

The somewhat extended details of the experimental work described in the preceding pages suggests the following summary of the essential results:

1. It has been stated that the bark of *Derris uliginosa* contains an alkaloid, but no evidence could be obtained of the presence of such a substance in the stems of the plant now examined.

2. The drug contains a considerable amount of *tannin* and *red coloring matter*. A quantitative determination of the tannin has shown this to exist to the extent of 9.3 per cent. in the bark, corresponding to 6.6 per cent. in the entire stem. It is the variety which gives a greenish coloration with ferric chloride.

Besides *gum* and *sugar*, the stems contain an appreciable amount of inorganic salts, notably *potassium nitrate*. The more important constituents, however, are those enumerated below, in connection with which some of the products afforded by them are also noted.

3. *Constituents of the Petroleum Extract.* The original alcoholic extract of the drug, when extracted by petroleum (b. p. 40–60° C.), afforded a considerable amount of a very dark colored, oily liquid. This was hydrolyzed by heating with alcoholic potash. The portion of the hydrolyzed product which had entered into combination with the alkali yielded a very small amount of a volatile acid, the silver salt of which gave figures agreeing with *caproic acid*, $C_6H_{12}O_2$. A crystalline acid was also obtained, having a melting point of 74–75° C., and agreeing in composition with *arachidic acid*, $C_{20}H_{40}O_2$. The mother liquors from the latter contained an acid which was identified by the analysis of its crystalline amide, m. p. 95–96° C., as *stearic acid*, $C_{18}H_{36}O_2$.

The portion of the hydrolyzed product which had not entered into combination with the alkali was found to contain a small amount of *ceryl alcohol*, $C_{27}H_{56}O$, m. p. 80–81° C., and a considerable quantity of two

isomers of *cholesterol*, $C_{28}H_{44}O$. One of these, which occurred in relatively small amount and was sparingly soluble in 90 per cent. alcohol, had a melting point of $207-209^{\circ}C$., while the one constituting the larger portion was more freely soluble in alcohol, and melted at $190-192^{\circ}C$. The optical rotation of the latter, in chloroform solution, was $[\alpha]_D = +25.5^{\circ}$. When dissolved in a little acetic anhydride, and a few drops of concentrated sulphuric acid added, both of them gradually developed a rose-red coloration, changing to brown.

The original resin, which had been extracted as above mentioned by petroleum, was redissolved in alcohol, precipitated by water, and dried. It was then extracted with chloroform, and thus resolved into portions soluble and insoluble therein.

4. *Resin soluble in chloroform.* This was an amorphous substance, which contained no nitrogen, and was not a glucoside. By the action of hydrochloric acid in alcoholic solution it afforded a small amount of a substance which crystallized in fine yellow needles, was very sparingly soluble in cold alcohol, and melted at $212-213^{\circ}C$. This would appear to be identical with the so-called "anhydroderrid" of Sillevoldt, but on analysis it gave somewhat different figures from those recorded by him. It is the intention to further examine this substance.

On fusion with potash this resin afforded *acetic* and *valerianic acids*, and a very small amount of a substance giving a violet coloration with ferric chloride. By the oxidation of the resin with nitric acid a small amount of a crystalline acid was obtained, melting at $75-76^{\circ}C$., and agreeing in composition with *behenic acid*, $C_{22}H_{44}O_2$. It is probable, however, that the latter pre-existed as such or in some form of combination in the resin. Other products of the oxidation were *oxalic acid*, and a pale yellow, crystalline substance, which, when dried at $115^{\circ}C$., melted at $170-172^{\circ}C$. This was a nitro product, and it was analyzed, but a decision regarding its constitution will be deferred until it can be more completely examined.

5. *Resin insoluble in chloroform.* This was obtained by the precipitation of its alcoholic solution with water in the form of an amorphous, chocolate-brown powder, which contained no nitrogen. Its alcoholic solution was observed to froth considerably when shaken with water. When heated with 5 per cent. sulphuric acid the filtered liquid was found to contain glucose, which was identified by means of its osazone. From the residual resin chloroform extracted a small amount of a substance, which, after purification by means of alcohol, crystallized in colorless, micaceous scales, melting at about $230^{\circ}C$. The amount of this substance was not sufficient for further examination. It was evident, however, from the small amount of sugar obtained by the hydrolysis that only a portion of this resin consisted of a glucoside.

On fusion with potash this resin afforded *acetic* and *protocatechuic acids*. When oxidized in a cold alkaline solution with potassium permanganate, the only crystalline product that could be isolated was *oxalic acid*.

6. The poisonous action of Derris on fish may be observed when a cold aqueous infusion of the bark is mixed with a relatively large portion of water. The toxic effect, however, is evidently due to some constituent of that portion of the resin which is soluble in chloroform, and not to the tannin which the drug contains. This was demonstrated by the stupefying and finally fatal effect produced on a gold-fish when brought into a liquid containing so little of the active substance as was represented by one part of the resin in one million parts of water. The portion of resin insoluble in chloroform, when tested under precisely the same conditions, was quite devoid of activity.

It is hoped that it may be possible at some future time, and with a larger quantity of material, to pursue the investigation of these resins from *Derris uliginosa*, especially with reference to the constitution of some of the crystalline substances that have been obtained from them, and also to compare these with the constituents of the closely allied plant—*Derris elliptica*.

Finally, I desire to express my indebtedness to Mr. Frederic H. Lees and to Mr. Frank Shedden, of the laboratory staff, for the very valuable assistance they have given me in conducting this investigation.

The Wellcome Chemical Research Laboratories, London.

Mr. Caspari then took up the paper by Dr. Perrédès, which he said was a companion-piece to that of Dr. Power, but stated that it was of such a character that he could not do justice to it by picking out a few lines here and there—it was not that kind of a paper, and there was no summary of conclusions with it; he therefore submitted it for publication, and invited attention to it in that form. He also spoke of the nine handsome and carefully prepared plates illustrative of the author's subject which accompanied the paper, and referred to the kindness of Messrs. Burroughs, Wellcome & Company, of London, who had generously donated sixteen hundred copies of these plates for insertion in the Proceedings, to accompany the paper in question.

Dr. Perrédès' paper in full is here given :

THE ANATOMY OF THE STEM OF DERRIS ULIGINOSA, *BENTH.*

AN EASTERN FISH POISON.

BY PIERRE ÉLIE FÉLIX PERRÉDÈS, B.SC., F.L.S.

Introductory.

The study here described was undertaken at the suggestion of Dr. F. B. Power, who at the time was engaged in a chemical investigation of the stems of this species of Derris. The material, comprising the different

parts of the plant, was obtained through the kindness of Mr. F. L. Langdale (Retired Lieutenant, Royal Navy), of Wakaya, Fiji, who had brought the drug to the notice of Messrs. Burroughs, Wellcome & Co., of London. In a letter to the latter firm, written in April, 1899, Mr. Langdale drew attention to the poisonous action of the plant upon fish, and stated that it is very abundant in Wakaya, where it is known as "Duva," but in the other islands of the Fiji group it is somewhat scarce on account of having been so largely used by the natives. By means of the specimens supplied, and the vernacular name, the plant was readily identified as *Derris uliginosa*, Benth., by Mr. E. M. Holmes, F. L. S., through whose kindness some further information was also obtained respecting it. Its general botanical characters and distribution are noted in the following work: "*Flora Vitiensis*."—A description of the plants of the Viti or Fiji Islands, with an account of their history, uses and properties. By Berthold Seemann, Ph.D., F.L.S., F.R.G.S. London, L. Reeve & Co., 1865–1873.

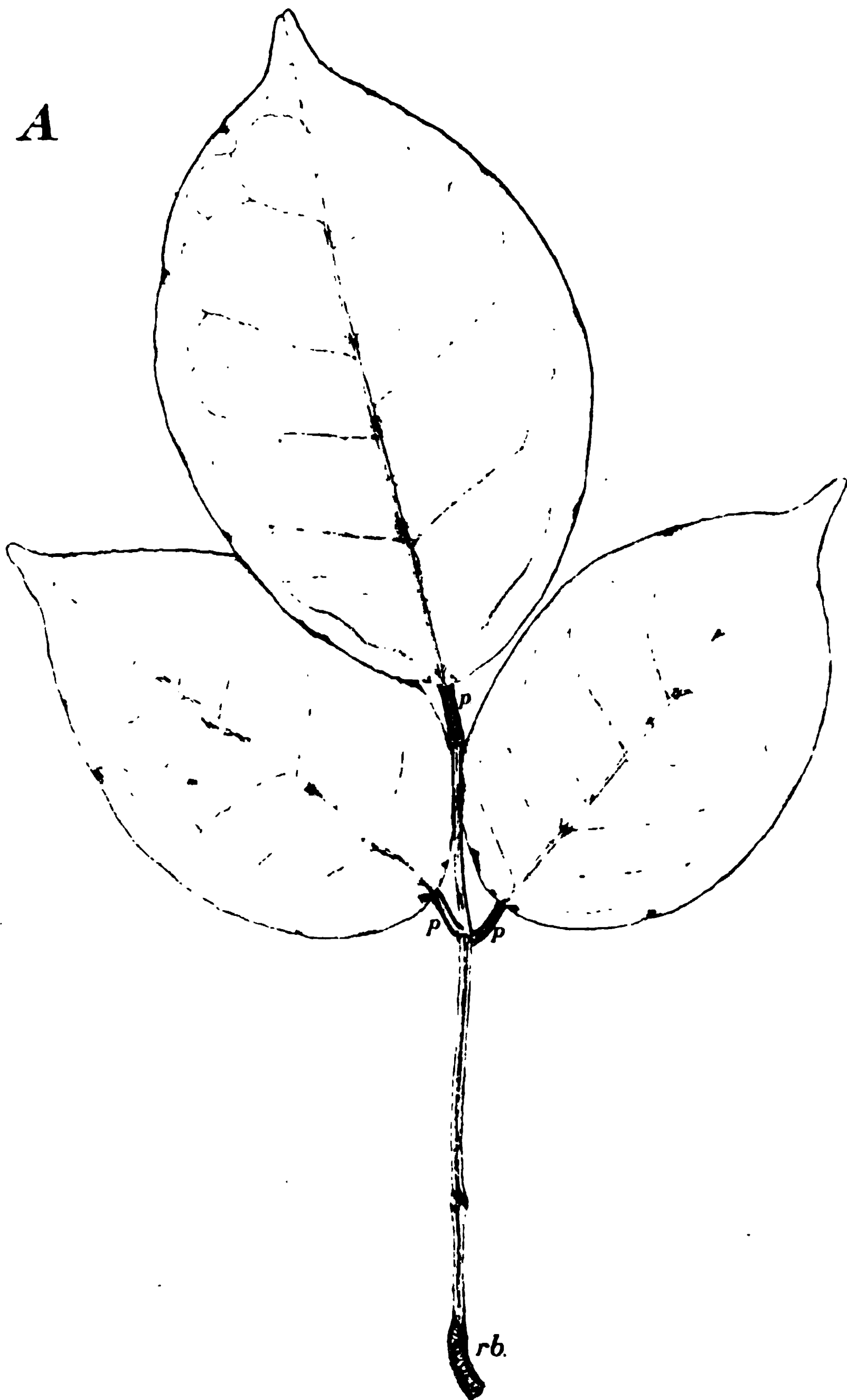
The above-mentioned work (p. 65) contains a number of other references to the plant, and a brief abstract of these may be here recorded.

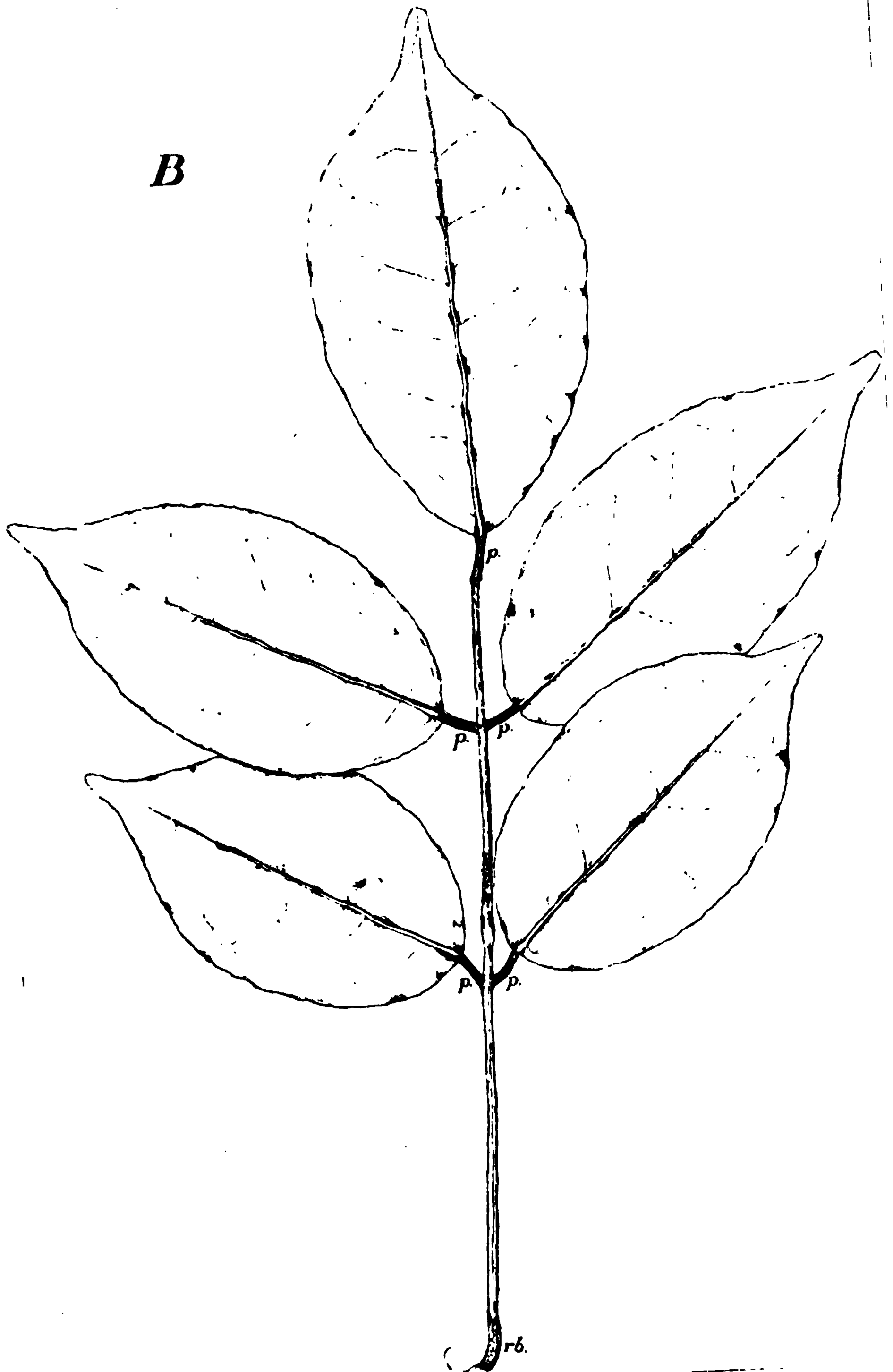
"*Derris uliginosa*, Benth., in Plant. Jungh., vol. i., p. 252; Flor. Austr., vol. ii., p. 272. *Pongamia uliginosa*, D. C. Prodr., vol. ii., p. 416. *P. religiosa*, Wight, in Hook. Bot. Misc., vol. iii., p. 301, et in Supp., t. 41, sub nom *P. triphylla*. *Mimosa* e N. Caledonia, Forst. Prodr., et in Sched. Herbarii Mus. Brit. Nomen vernæ, Vitiense, 'Duva.' A common seaside climber, growing with *Hibiscus tiliaceus* and *Ximenia elliptica*. (Seemann, n. 127; Storck, n. 883; U. S. Expl. Exped.). Also collected in the Tongan Islands (U. S. Expl. Exped.), New Caledonia (Forster), Eromanga (McGillivray), the east coast of New Holland, East Indies, Indian Archipelago, China, and southeast Africa."

"Grows plentifully on the sea-beach, and by its long running root-stock helps to keep the same together. The flowers appear from every part of the plant, and occasionally, as specially noticed by Mr. Storck ('Bonplandia,' vol. x., p. 296), from the roots. The leaves are pounded and thrown into the water by the natives for the purpose of stupefying and then catching fish, the practice being the same as I saw practiced by the American Indians in the Isthmus of Panama and elsewhere."

Derris uliginosa is also described in the "Pharmacographia Indica," vol. i., p. 470. Its habitat is there stated to be the Eastern Himalayas, Western Peninsula, and Ceylon, and its vernacular names—*Pānlata* (Beng.), *Kājarvel*, *Kirtāna* (Mar.). It is further stated that "this woody climber is the most widely-spread species of the genus, and is worthy of notice on account of the activity of its bark as a fish poison, for which purpose it is used in Zambesi-land. In India it is known to act as a poison upon worms and the larvæ of insects which trouble the cultivators, whence the Marathi name *Kirtāna*, or 'worm-creeper.'"

A





The following description of the anatomy of the stem of this species of *Derris* is preceded by a short account of the other portions of the plant, namely, leaves, fruit, and seed. These were examined as received, in the dry state.

Leaves.

Leaves (figs. A and B, plates I and II) compound, imparipinnate, with one or two pairs of lateral leaflets and a terminal one, this terminal leaflet being frequently the largest. Rachis 8 to 12.5 centimeters long, glabrous, channelled on the upper surface, convex on the lower one, compressed at the base into a dark brown, transversely ribbed structure (*rb*, figs. A and B) which is slightly convex on the upper and on the under surface, each side being furnished with two distinct margins, thus presenting a shortly four-winged appearance in transverse section.

Leaflets 6.5 to 9.5 centimeters long, petiolate, oval, with a tendency to an obovate shape, especially in the terminal one, acuminate but obtuse at the apex; somewhat coriaceous; glabrous; yellowish-green on the upper surface, somewhat paler on the under one; petiole 5 to 7 millimeters long, resembling the flattened rachis-base of the leaf in every particular (*p.*, figs. A and B), and tapering into the smooth, wavy, and prominent midrib on the under surface (fig. B); on the upper surface the midrib is depressed (fig. A); the lateral veins, which are scarcely prominent on the upper or on the under surface, are generally given off at a rather wide angle from the midrib, and fork near the wavy and entire margin of the leaflet, forming a somewhat ill-defined and irregularly curved line.

Fruit.

The fruit consists of a somewhat flattened, oblong, or more or less rounded pod (figs. C and D, plate III), generally about 3 centimeters wide and varying in length from 3.5 to 6 centimeters. It bears at the apex the remains of the style (*st.*, figs. C and D) and at the base the scar of the peduncle (*ped. sc.*, figs. C and D). The pericarp consists of three well-defined regions, viz.:

α . An outer papery, glossy, yellowish-grey coat (*a*, figs. C and D) marked with irregularly arranged raised ridges and dappled with dark brown spots; the prominences (*p.p.*, figs. C and D) due to the ventral sutural wing (*v. s. w.*, fig. C) are especially evident.

β . A middle layer (β , figs. C and D) composed of delicate anastomosing fibrous tissue attached to the woody dorsal ridge (*d. s. r.*, figs. C and D) and ventral sutural wing (*v. s. w.*, fig. C), the latter becoming lost near the base of the pod.

γ . An inner papery layer (γ , figs. C and D) possessing a greyish satiny lustre and bearing the imprints of the fibrous network. The pericarp

encloses from one to three seeds, in the pods I have examined; these are attached to the placental surface on the ventral sutural wing.

Seeds.

The seeds (figs. E, F, G and H, plate III) are also somewhat flattened and rounded kidney-shaped in outline. The testa (*test.*, figs. E, F, G and H) is of a rich reddish-brown color, membranous, and very much wrinkled. It invests loosely two somewhat curved, starchy cotyledons (*cot.*, figs. G and H), and, owing to the curvature, a more or less biconvex cavity is formed between these (*sp.*, fig. G). The hilum (*hi.*, figs. E and F) occurs approximately at the middle point of the less curved edge of the seed, while the micropyle (*mic.*, figs., E and F) is situated near one extremity of the hilum, and on opening the seed in the plane separating the two cotyledons the radicle and plumule will be found in this region, as shown in the figure (*rad.* and *pl.*, fig. H).

Stem.

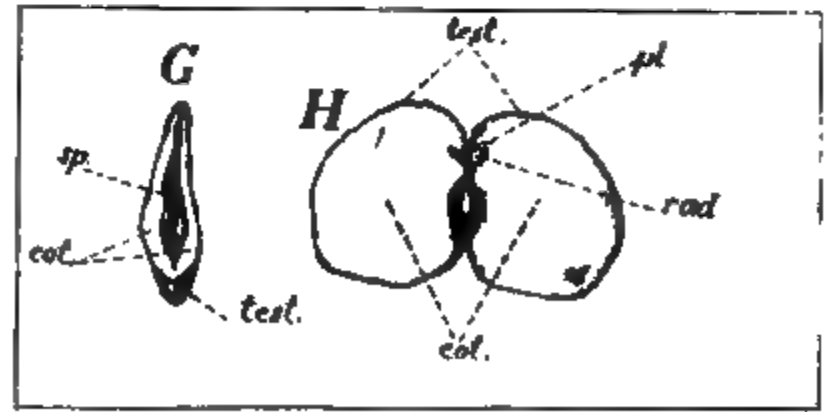
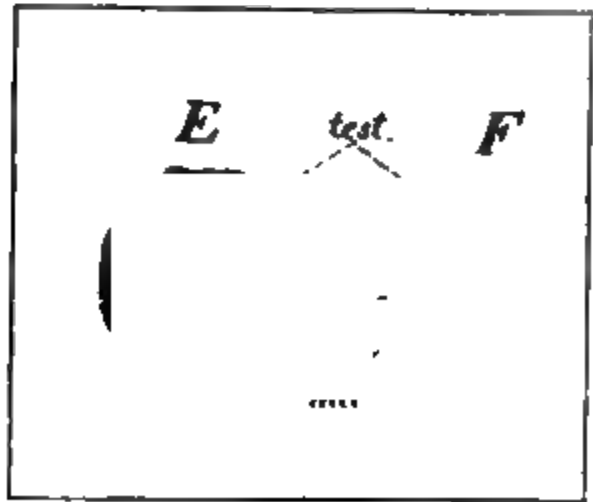
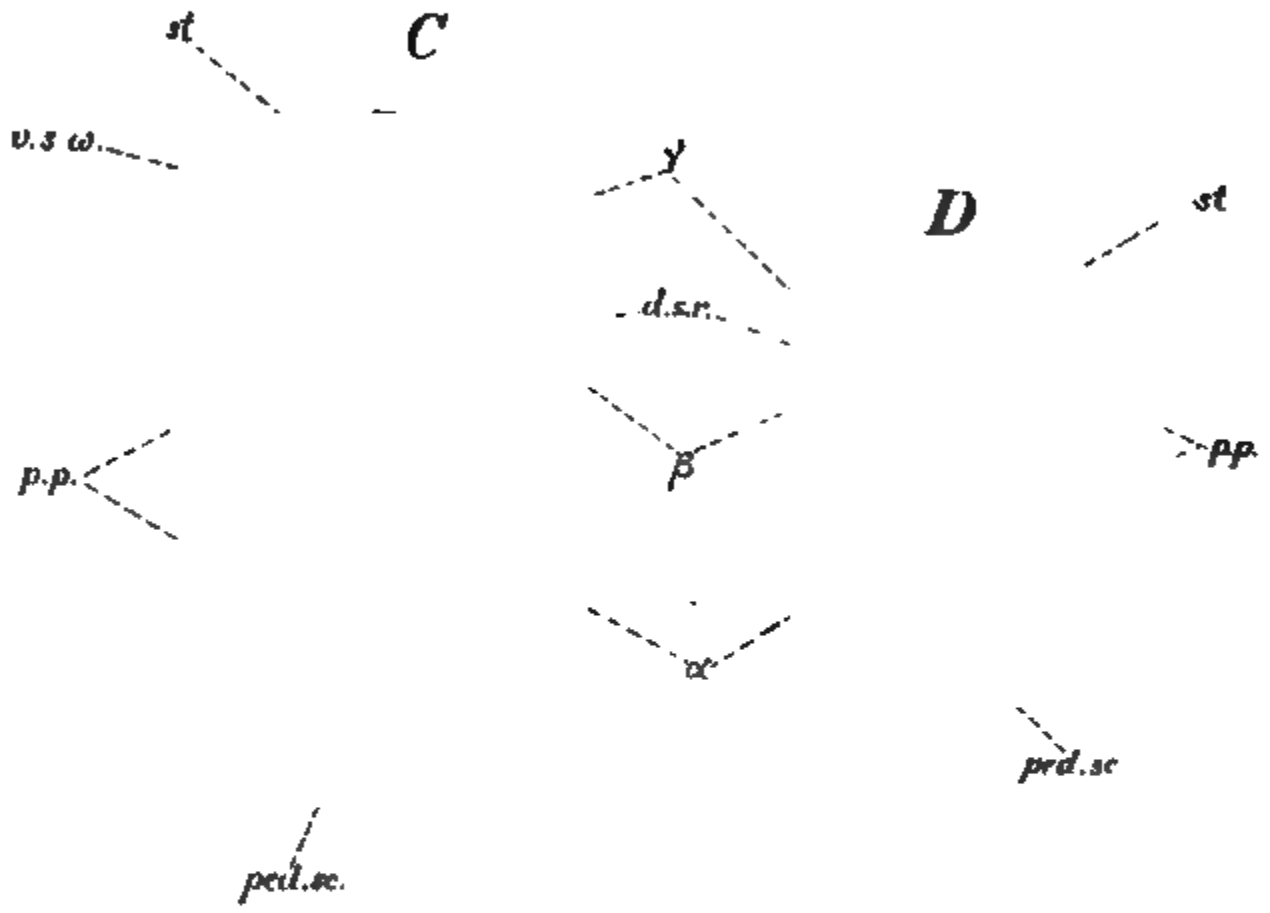
The sample examined, which represents the material employed by Dr. Power for chemical investigation, consisted of pieces varying from 10 to 23 centimeters in length and from 8 to 25 millimeters in diameter.

Most of the pieces occur in groups made up of two portions of stem, twined around each other in the way shown in fig. 1, plate IV.

The surface is rusty-brown, and marked with alternating longitudinal ridges (*l. r.*, fig. 1) and furrows, some of which are very prominent; they follow the twist of the stem, and bear numerous thick-lipped, transverse, reddish-brown warts (*l.*, fig. 1), rendering the bark rough to the feel. The remains of buds (*b.*, fig. 1) are apparent at intervals as protruding masses.

The transverse section of one of the thinner pieces (fig. 2) shows, under a lens, a fairly regular bark (*c.*, fig. 2) which is light colored near the periphery, but dark brown, crossed by lighter medullary rays, towards the wood. The wood (*x.*, fig. 2) is yellowish in color, porous, and without any apparent radiate structure, but marked with more or less concentric darker rings (*br. p.*, fig. 2). The portion surrounding the pith (*c. s.*, fig. 2) is uniformly light yellow in color and compact in structure. The pith (*m.*, fig. 2) is small, light, and friable.

In the larger pieces (figs. 1 and 3) the general structure remains the same, but peripheral strands (*p. b.*, figs. 1 and 3), consisting of a woody core surrounded by bark, have made their appearance; it is to these that the prominent ridges of the stem are due. The light colored peripheral region of the bark has been replaced by a distinct white line (*sc. l.*, fig. 3) separating an outermost dark brown portion (*k.*, fig. 3) from the inner one containing the wavy medullary rays. In the wood the dark



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bands (*br. p.*, fig. 3) are more distinct. The remaining characters are the same (compare figs. 2 and 3).

ANATOMICAL STRUCTURE.

I. The Bark.

Outer bark (*k.*, figs. 4 and 18, plates V and VI) many cells thick, and consisting of tabular, thin-walled, and tangentially elongated cork cells, arranged in radial rows (figs. 4, 5 and 18).

This gradually passes into the cortex (*cort.*, figs. 4 and 18), which is generally from 10 to 12 cells thick, and composed of large and somewhat irregularly arranged, tangentially elongated, polygonal thin-walled cells; the cortex is terminated by a sclerenchymatous sheath (*scl. l.*, figs. 4 and 18; figs. 6 and 7), made up of thick-walled stone cells (*sc.*, figs. 6 and 7), wedged together so as to form a layer 1 to 3 cells thick, with an occasional gap taken up by a parenchymatous cell (*l.*, fig. 6). At intervals also, groups of (pericyclic?) fibers occur in it (*p. f.* and *p'. f'*., figs. 4, 6, 7 and 18). This sclerenchymatous sheath invests the bast. Those cortical cells which are in close proximity to the sclerenchymatous sheath frequently consist of sacs containing prismatic crystals of calcium oxalate. The parenchymatous cells abutting internally on this sheath may also contain such crystals, but they are not so abundant as in the previous case.

The bast (figs. 4, 8 and 15) is made up of the bast rays (*B. r.*, figs. 4 and 8), separated by medullary rays (*M. r.*, figs. 4 and 8). The medullary rays in the outer portion are wide, and consist of tangentially elongated, polygonal thin-walled cells (figs. 4, 8 and 9); sometimes a single stone cell is found among the latter, sometimes a group of two or three (*sc.*, fig. 4; figs. 10, 11, 12, 13 and 14); these assume a variety of forms, and the thickness of their walls also varies very considerably. In the inner portion the medullary rays narrow down till they become 2 to 4 (or more) cells wide (fig. 4), the component cells becoming radially elongated and tabular in form (figs. 4 and 15). The bast rays (*B. r.*, figs. 4 and 8) are wedge-shaped in transverse section, and are traversed by smaller medullary rays for a varying portion of their length (*M. r.*, figs. 4 and 8); the fiber groups of the sclerenchymatous sheath, mentioned above, generally lie opposite their outer extremities (protophloëm). This, however, is not invariably the case; for instance, in the section from which fig. 4 is sketched, a group (*p'. f'*., fig. 4) occurs just opposite a medullary ray. The outer extremity of a bast ray consists mostly of collapsed sieve-tubes alternating with bast parenchyma; this arrangement is succeeded by the following for the greater portion of the wedge:

(a) Strands of collapsed sieve-tubes, usually less crushed on the inner than on the outer side (*c. s. t.*, figs. 4, 8 and 15).

(b) Strands of bast fibers (*b. f.*, figs. 4, 8 and 15; fig. 16).

(c) Longitudinal rows of nearly cubical crystal-containing sacs (*cryst.* figs. 8 and 15); these cells always occur in connection with the fibers, and the prismatic crystals of calcium oxalate they contain are enclosed in a thin membrane.

(d) Bast parenchyma, in layers generally two or three cells thick (*b. par.*, figs. 4, 8 and 15); cells approximately isodiametric in transverse section (fig. 8), axially elongated in a longitudinal section (figs. 15 and 17), and marked with pits on the radial walls (fig. 17).

Towards the inner side the sieve-tubes become less collapsed, till their normal shape is reached (*s. t.*, fig. 4). The innermost layer of the bark consists of undifferentiated desmogen cells (*camb.*, fig. 4).

It is to be noted that while the bast fibers do not react appreciably with phloroglucin and hydrochloric acid, the crystal-containing sacs do so very readily. With chlor-zinc-iodine solution the bast fibers (and the fibers of the sheath groups also) are stained purplish-brown; it is evident, therefore, that lignification, if it has taken place here at all, has done so but slightly.

A section through a "wart" shows the typical structure of a lenticel (*l.*, fig. 18).

Cell Contents.—The cells of the corky layer contain dark brown coloring matter (fig. 5), turned black by ferric chloride, but almost unaffected by caustic potash, chloral hydrate or alcohol. The cells of the cortex also contain brown coloring matter, but it is less dense and not nearly so intractable as that of the cork; it is darkened by ferric chloride; starch may also occur here. The cells of the medullary rays may contain starch, in simple grains throughout (fig. 19); brown coloring matter is also present, but more sparingly; it is dissolved by caustic potash or chloral hydrate and darkened by ferric chloride. The cells of the bast parenchyma are uniformly filled with dense brown coloring matter, darkened by ferric chloride and by caustic potash, and subsequently dissolved by the latter, also soluble in alcohol and chloral hydrate; to this localization of the coloring matter the dark wavy appearance of the inner portion of the bark is due. With a strong lens it is possible to make out the alternating tangential lines of dark bast parenchyma and light bast fibres, together with the collapsed sieve-tissue.

The presence of calcium oxalate and its mode of occurrence has already been mentioned.

II. The Wood.

The wood in transverse section shows the following general arrangement:

Medullary sheath (*m. s.*, fig. 20, plate VII) very distinct, and surrounded by a compact sheath of strongly lignified tissue (*c. s.*, fig. 20), traversed radially by strands of vascular tissue (*vb.*, fig. 20) and by medullary rays; the latter are not easily distinguishable from the ordinary

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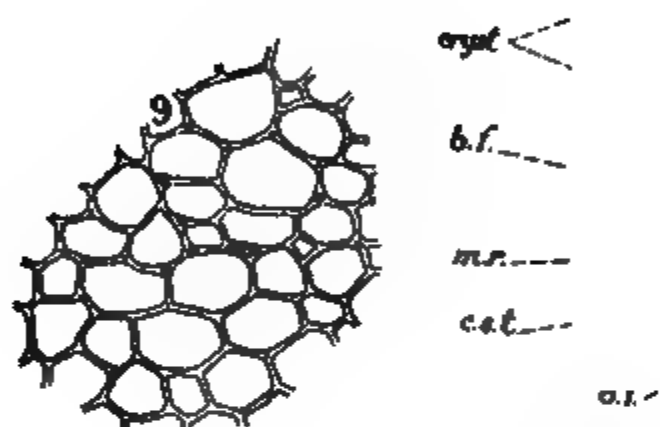
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tissue of the sheath in transverse section; their component cells, however, are somewhat larger, and occur in more regular radial rows; they are, furthermore, distinguished by abundance of starch.

The remainder of the wood (that is, the bulk of the wood-cylinder) is composed of wood vessels (*v.*, and *gp. v.*, figs. 20 and 21), surrounded by thick-walled and lignified parenchymatous cells (*x. par.*, figs. 20 and 21), and of groups of wood-fibers (*w. f.*, figs. 20 and 21), either of these alternating more or less regularly with thin-walled parenchyma (*t. w. p.*, figs. 20 and 21). The whole is traversed by medullary rays (*m. r.*, figs. 20 and 21) which are usually two or three cells wide, and which follow a tortuous course, owing to the great size of some of the vessels.

The details of these various tissues and cell-forms, which will now be described, are shown in the accompanying figures.

(a) The vessels. Some of these are very large, and occupy, together with the accompanying parenchymatous cells, the whole space between two contiguous medullary rays (*v.*, figs. 20 and 21); others are much smaller, and usually occur in groups (*gp. v.*, figs. 20 and 21). The large vessels are generally of the usual type (*v.*, figs. 22 and 24; fig. 23); some, however, may be found which resemble tracheïds in form (fig. 25), the perforations occurring on oblique or lateral walls (*perf.*, fig. 25); in the small vessels the perforations are nearly always obliquely placed (*perf.*, figs. 26, 27 and 28), in every case the walls are furnished with transversely elongated, and, in most cases, evidently bordered pits (figs. 24 to 28). Some of the vessels contain yellowish-brown columnar masses (shown in longitudinal section in fig. 23, in transverse section in fig. 29); these masses stain very readily with phloroglucin and hydrochloric acid, but are unaffected by ferric chloride, chlor-zinc-iodine, sulphuric acid, sulphuric acid and iodine, chloral hydrate or alcohol; they are rendered slightly more hyaline by caustic potash, and resist the action of Schultze's maceration mixture to a remarkable degree.

(b) The wood-fibers (*w. f.*, figs. 20, 21, 22 and 24) occur either in separate groups, as above stated, or in connection with the lignified parenchyma surrounding the vessels (fig. 21). In the former case they have, closely associated with them, strands of crystal-containing sacs (*cryst.*, figs. 21, 22 and 24) which are arranged in axial rows (*cryst.*, figs. 22 and 24); the crystals are similar to those of the bast, but larger as a rule, and, like the latter, are enveloped in a thin membrane. As in the bast, these sacs, or rather the crystal-enveloping membranes in them, react strongly with phloroglucin and hydrochloric acid. The fibers are polygonal in transverse section, and have a small lumen, the middle lamella is strongly lignified and contrasts sharply with the central portion when treated with staining reagents (*w. f.*, fig. 21); for instance, with phloroglucin and hydrochloric acid the former reacts strongly, whereas

the latter is hardly affected; with chlor-zinc-iodine the latter is stained dark purplish-brown, while the former is stained yellow, giving an appearance which is thus roughly the converse of that produced by the first named reagent. In longitudinal section the fibers are seen to possess simple pointed ends (*w. f.*, figs. 22 and 24).

(c) The elements constituting the bulk of the compact sheath surrounding the pith are fibrous in form (figs. 30 and 31); they are furnished with simple and somewhat distant pits on their walls, and are chambered by delicate transverse septa. Except at the boundaries of the sheath it is very difficult indeed to determine their exact shape; this may be accounted for by the fact that their ends are variously forked and elongated (as shown in figs. 32 to 36, which represent these elements isolated by maceration) and would, therefore, be intimately interlocked in the tissue.

(d) The general parenchyma. In the neighborhood of the vessels this consists of cells with strongly lignified walls (*x. par.*, figs. 20, 21, 22 and 24); in transverse section these cells are polygonal in form (*x. par.*, figs. 20 and 21; figs. 37 and 40) and marked with large, and for the most part, simple pits (fig. 37); in longitudinal section (*x. par.*, figs. 22 and 24; figs. 38 and 39) they are usually tabular in form, elongated in axial direction, and furnished with round or oval pits on their radial (fig. 38) and tangential (fig. 39) walls, these pits having not infrequently the appearance of being bordered. They contain an abundance of starch in simple grains (fig. 40).

The remaining cells of the parenchyma (*t. w. p.*, figs. 20, 21, 22, 24 and 41) are thin-walled and more nearly isodiametric in transverse section than the above (*t. w. p.*, fig. 21; fig. 41), while in longitudinal sections they are almost identical in form with them (*t. w. p.*, figs. 22 and 24); they contain dense brown coloring matter (fig. 41), similar to that of the bast parenchyma in every particular.

It is to the preceding tissue that the darker rings (*br. p.*, figs. 2 and 3), seen under a lens, are due.

(e) The cells of the medullary rays are generally tabular in form and radially elongated in transverse and in radial longitudinal sections (figs. 20, 21, 22, 42 and 43), polygonal and isodiametric in tangential longitudinal section (figs. 24 and 44). In the compact sheath investing the pith, however, they are isodiametric in transverse (fig. 20), but axially elongated in longitudinal section (fig. 45).

In the vicinity of the vessels these cells have, like those of the general parenchyma, strongly thickened and lignified walls (*l. m. r.*, figs. 21, 22, 24; figs. 42, 43 and 44) which are furnished with more or less rounded pits, most numerous on the tangential walls (fig. 44), and not infrequently also presenting a bordered appearance (figs. 42, 43 and 44).

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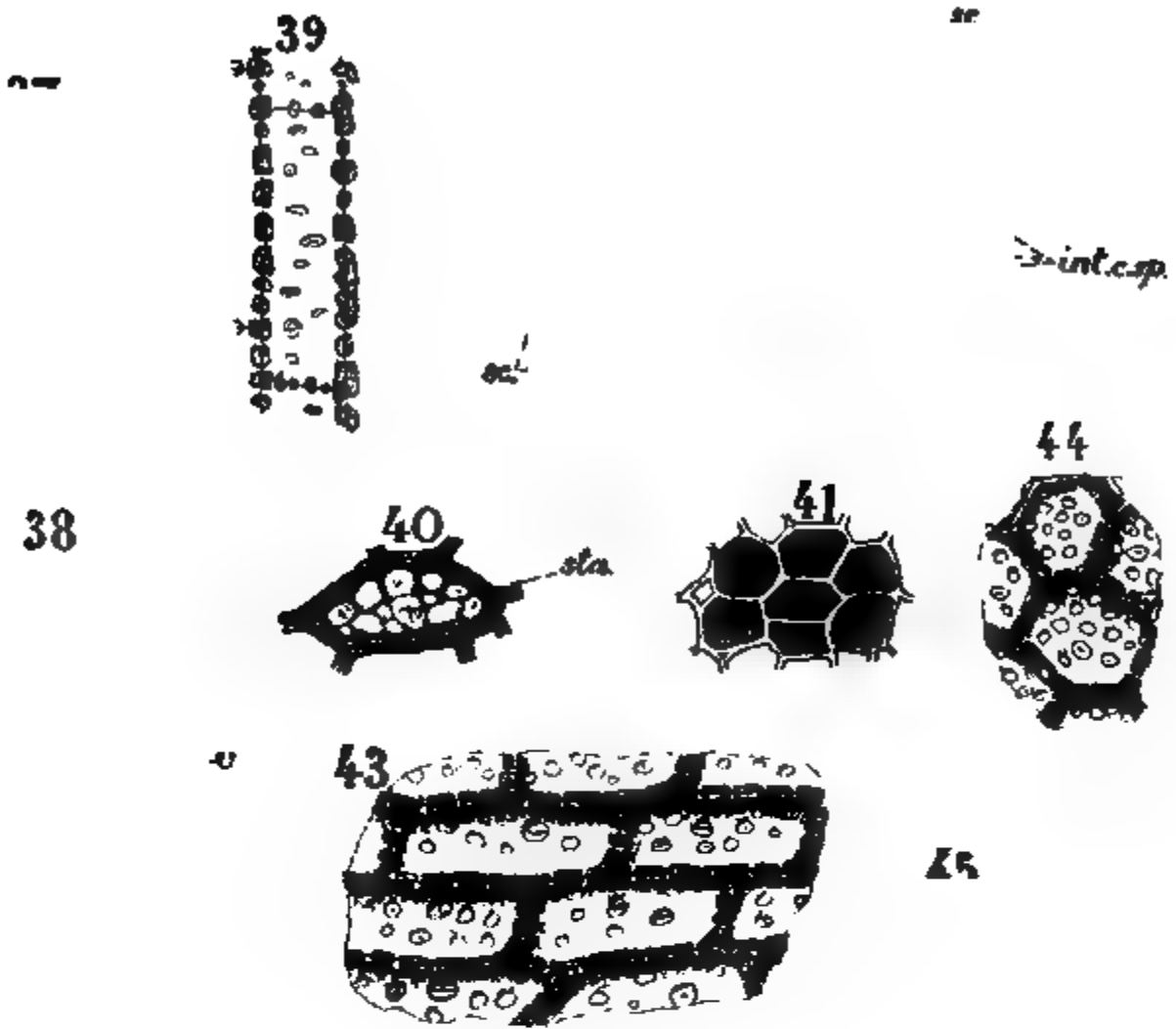
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PLATE IX.



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The portions of the medullary rays which traverse the pith-investing sheath are entirely composed of lignified cells which resemble those just described in most points, but they are axially and not radially elongated (fig. 45), as already noted.

The other cells of the medullary rays (figs. 20 and 21) differ from the first of the above in being thin-walled, not lignified, and in possessing obviously simple pits only.

All the cells of the medullary rays contain an abundance of starch in simple grains, similar to those shown in fig. 40.

III. The Pith.

The pith consists of thin-walled tissue (*m.*, fig. 20; fig. 46) in which numerous stone-cells occur (*sc.*, figs. 20 and 46); in both cases the cells are more or less isodiametric in all directions, rounded in form, and separated by intercellular spaces (*int. c. sp.*, figs. 20 and 46). The walls of the stone-cells are lignified and canaliculate, but comparatively slender; in surface view the canals are evident as simple pits.

All the cells of the pith may contain starch. In the vicinity of the medullary sheath an occasional stone-cell is found which is axially elongated and contains brown coloring matter, similar to that of the cork cells in the bark.

IV. The Peripheral Strands.

A portion of one of these is shown in transverse section in fig. 47. It is found to reproduce, in miniature, the structure of the whole stem in all essential particulars. It will be noticed that there are two sclerenchymatous layers present, one external and continuous with that of the normal portion of the bark (*sc. l.*); the other internal, pushed inwards, and separated from the parent layer by a gap (*sc. l. (2)*). It would seem, at first sight, that this internal layer is of subsequent formation; this, however, is rendered improbable by the fact that the pericyclic fibres are found *only* in the internal layer—in no case have I found them in the external one. This tends to show pretty conclusively that these peripheral strands are of cortical origin.

Note.—The term “bark” has been used in its ordinary English signification. For an explanation of this see a previous paper on “The Anatomy of the Bark of *Robinia Pseud-acacia*, Linné,” in the *Year-Book of Pharmacy*, 1901, p. 380.

EXPLANATION OF FIGURES.

Plate I. Fig. A. Leaf, upper surface. *rb.*, flattened, expanded and ribbed rachis-base of leaf; *p.*, petioles of leaflets. Natural size.

Plate II. Fig. B. Leaf, under surface. Lettering as in A. Natural size.

Plate III. Fig. C. A long, and Fig. D. a short pod. *st.*, remains of style; *ped. sc.*, scar of peduncle; α , outer ridged and dappled coat; β , middle fibrous layer; γ ,

inner satiny coat; *v. s. w.*, ventral sutural wing; *d. s. r.*, dorsal sutural ridge; *pp.*, prominences due to ventral sutural wing. Natural size.

Plate III. Figs. E and F. Seeds, external view. *test.*, testa; *hi.*, hilum; *mic.*, micropyle. Natural size.

Plate III. Fig. G. Transverse section of seed. *test.*, testa; *col.*, cotyledons; *sp.*, space enclosed by cotyledons. Natural size.

Plate III. Fig. H. Seed, showing cotyledons separated. *test.*, testa; *col.*, cotyledons; *pl.*, plumule; *rad.*, radicle. Natural size.

Plate IV. Fig. I. Portions of two stems, showing twining habit. *b.*, remains of buds; *l. r.*, longitudinal ridges; *l.*, reddish-brown warts; *c.*, bark; *x.*, porous wood; *p. b.*, peripheral strands; *w.*, place where bark has been wounded. Natural size.

Plate IV. Fig. 2. Transverse section of a small piece. *c.*, bark; *x.*, porous wood; *c. s.*, compact sheath surrounding pith; *m.*, pith; *br. p.*, irregular dark streaks. $\times 3$ diameters.

Plate IV. Fig. 3. Transverse section of an average-sized piece (*e. g.*, Fig. 1). *k.*, outer dark brown layer; *scl. l.*, sclerenchymatous layer; *p. b.*, peripheral strands. Other lettering as in Fig. 2. $\times 3$ diameters.

Plate V. Fig. 4. Transverse section through bark. *k.*, cork; *cort.*, cortex; *scl. l.*, sclerenchymatous sheath; *p. f.* and *p' f'.*, fiber groups; *M. r.*, medullary rays; *m. r.*, smaller medullary rays; *B. r.*, bast rays; *sc.*, stone cells; *c. s. t.*, collapsed sieve-tissue; *b. f.*, bast fibers; *b. par.*, bast parenchyma; *s. t.*, sieve-tubes; *comb.*, desmogen cells. $\times 75$ diameters.

Plate V. Fig. 5. Cells of cork-layer in transverse section. $\times 150$ diameters.

Plate V. Fig. 6. Portion of sclerenchymatous sheath in transverse section. *sc.*, stone cells; *p. f.*, group of fibers; *l.*, thin-walled parenchymatous cell; *cort.*, cortical region. $\times 150$ diameters.

Plate VI. Fig. 7. The same in radial longitudinal section. Lettering as in Fig. 6. $\times 150$ diameters.

Plate VI. Fig. 8. Portion of bast in transverse section. *cryst.*, crystal-bearing cells. Other lettering as in Fig. 4. $\times 150$ diameters.

Plate VI. Fig. 9. Cells from wide portion of medullary ray in radial longitudinal section. $\times 180$ diameters.

Plate VI. Figs. 10 and 11. Stone cells of medullary ray in transverse section. $\times 150$ diameters.

Plate VI. Figs. 12, 13 and 14. Stone cells of medullary ray in radial longitudinal section. $\times 150$ diameters.

Plate VI. Fig. 15. Portion of bast in radial longitudinal section. Lettering as in Fig. 8. $\times 150$ diameters.

Plate VI. Fig. 16. Fragment of a bast fiber. $\times 150$ diameters.

Plate VI. Fig. 17. Cell of bast parenchyma showing pits on radial walls. $\times 180$ diameters. The cross in Fig. 15 indicates the region in which the cell occurred.

Plate VI. Fig. 18. Transverse section through a "wart." *l.*, lenticel. Other lettering as in Fig. 4. $\times 75$ diameters.

Plate VI. Fig. 19. Cell of medullary ray in transverse section, showing simple starch grains. $\times 180$ diameters. The cross in Fig. 8 indicates the region in which the cell occurred.

Plate VII. Fig. 20. Transverse section through pith and central portion of wood. *m.*, pith; *m. s.*, medullary sheath; *c. s.*, compact sheath; *x.*, wood; *v.*, vessels; *gp. v.*, groups of vessels; *px.*, protoxylem groups; *v. b.*, vascular strand transversing compact sheath; *m. r.*, medullary rays; *t. w. p.*, thin-walled parenchyma; *w. f.*, wood fibers; *x. par.*, lignified parenchyma; *sc.*, stone cells of pith; *int. c. sp.*, intercellular spaces in pith. $\times 75$ diameters.

Plate VII. Fig. 21. Transverse section through wood about half way between cambium and pith. *l. m. r.*, lignified portion of medullary ray; *cryst.*, crystal-containing cells. Other lettering as in Fig. 20. $\times 150$ diameters.

Plate VIII. Fig. 22. Radial longitudinal section through wood, in same region as Fig. 21. Lettering as in Fig. 21. $\times 150$ diameters.

Plate VII. Fig. 23. Longitudinal section through vessel, showing contents. $\times 150$ diameters.

Plate VIII. Fig. 24. Tangential longitudinal section through wood, in same region as Figs. 21 and 22. Lettering as before. $\times 150$ diameters.

Plate VIII. Figs. 25, 26, 27 and 28. Segments of vessels isolated by maceration. *perf.*, perforations. $\times 150$ diameters.

Plate VIII. Fig. 29. Transverse section through small vessel, showing granular contents. $\times 300$ diameters.

Plate VIII. Fig. 30. Element of compact sheath from the border of the pith, showing transverse septa and pits. $\times 150$ diameters.

Plate VIII. Fig. 31. A group of the same. $\times 300$ diameters.

Plate VIII. Figs. 32, 33, 34, 35 and 36. Ends of elements of compact sheath, showing forking and elongation (isolated by maceration). $\times 150$ diameters.

Plate IX. Fig. 37. Transverse section through cells of wood parenchyma in the neighborhood of a vessel, showing pits. $\times 300$ diameters.

Plate IX. Fig. 38. Radial longitudinal section through same. $\times 300$ diameters.

Plate IX. Fig. 39. Tangential longitudinal section through same. $\times 300$ diameters. (This has been left unshaded in order to show the thickening more clearly.)

Plate IX. Fig. 40. Transverse section through same, showing starch. $\times 300$ diameters.

Plate IX. Fig. 41. Transverse section through thin-walled parenchyma of wood, showing contents. $\times 300$ diameters.

Plate IX. Fig. 42. Transverse section through lignified portion of medullary ray. $\times 300$ diameters.

Plate IX. Fig. 43. Radial longitudinal section through same. $\times 300$ diameters.

Plate IX. Fig. 44. Tangential longitudinal section through same. $\times 300$ diameters.

Plate IX. Fig. 45. Radial longitudinal section through portion of medullary ray of compact sheath. $\times 300$ diameters.

Plate IX. Fig. 46. Longitudinal section through pith. Lettering as in Fig. 20. $\times 150$ diameters.

Plate IX. Fig. 47. Transverse section through portion of peripheral strand. *scl. l.*, additional sclerenchymatous layer; *scl. l. (2)* inner sclerenchymatous layer. (This is part of the original sclerenchymatous sheath broken away from the parent one and pushed in during the development of the peripheral strand); *camb.*, cambium. Other lettering as before. $\times 75$ diameters.

Lignified tissue shaded throughout, as far as practicable.

The Wellcome Research Laboratories, London.

MR. BARTLEY: As these papers have been presented in abstract, thus giving little chance for discussion, I move that they be referred to the Publication Committee.

The motion was seconded by Mr. Hallberg.

Discussing the papers just read, Mr. Edward Kremers called attention to the occurrence of potassium chloride with the resin, apparently the active constituent of the drug, also to the presence of the same salt in kava-kava, of which the active constituent is likewise a resin. He also

pointed out that in the extraction of kava-kava with either alcohol or water, both substances are extracted and are separated in the process of purification. The possibility of a loose chemical combination seems to suggest itself, the potassium chloride probably rendering the resin more soluble in water, and *vice versa*, the resin, combined with the salt, rendering it more soluble in alcohol. The preparation of the kava-kava beverage may thus find a scientific explanation. The suggestion should be regarded merely as such, not as a statement of fact based upon careful experimentation.

THE CHAIRMAN: The Chairman would like to say, with reference to these papers, that he wrote to Dr. Power early in the year, asking him if he could not favor us with such a paper, and he at first thought he could not do so, but afterwards concluded he could, and I got the two letters from him by the same steamer, strange to say. I think these are among the best papers we have had for many years. The paper of Dr. Power is very full in every respect. The result in this case shows that we can sometimes get papers by stirring up our members and asking them to contribute.

The motion to refer for publication was then put and carried.

The Chair then called for a paper by Messrs. Schlotterbeck and Watkins on "The Alkaloids of *Adlumia Cirrhosa*," which Mr. Schlotterbeck presented in abstract, receiving the applause of his auditors. The paper in full was as follows:

THE ALKALOIDS OF *ADLUMIA CIRRHOSA*. (SECOND PAPER.)

BY J. O. SCHLOTTERBECK AND H. C. WATKINS.

In a previous paper* "*Adlumia cirrhosa*, a new Protopine-bearing Plant," the preliminary experiments upon the root of the first year's plant of this biennial were reported. Of the dried root only about 100 grams was available, and it was treated as follows: It was first moistened with dilute ammonia water for the purpose of liberating the alkaloids from their combinations with acids. To avoid any possible change in the nature of the constituents the powder was dried at room temperature by spreading out in thin layers in a room in which there was good circulation of air. The drug was now exhausted with chloroform, in a Soxhlet apparatus, since most free alkaloids are easily soluble in this solvent. The chloroform was recovered from the solution by distillation and the stiff, waxy residue then repeatedly digested with hot, very dilute acetic acid until all alkaloidal matter had been extracted. The combined acid aqueous extracts were concentrated, cooled, filtered and precipitated with ammonia water, being careful to avoid a great excess. The curdy precipitate was thoroughly washed on a filter, redissolved in dilute acetic acid, placed in a separator, made alkaline with ammonia and shaken out with ether. Solution of the alkaloid was almost instantaneous, but only temporary. The ethereal

* Amer. Chem. Journal, 24, 249. Proc. Am. Pharm. Assoc., 48.

liquid was passed through a tuft of cotton into a wide-mouthed flask and set aside. In a very short time crystals began to separate and in the course of two hours most of the alkaloid had crystallized out. This alkaloid upon purification was found to be protopine, and at the time it was thought that it was the only alkaloid present in the root.

Wishing to continue the chemical study of this interesting and widely known plant, an endeavor was made to secure it in large quantities. Although it is claimed that it grows wild in wet woods from New England to Michigan and eastern Kansas southward, it was impossible to obtain the plant from botanic druggists, and collectors could not be found to gather it. We then decided to grow it ourselves. The small, shiny black seeds were obtained without difficulty from seedsmen and sowed as directed, in spring. Not a single seed germinated that year. Not desiring to postpone the work for a year, growing plants were solicited from the citizens of Ann Arbor, who grow it quite generally about porches and doorsteps. About 150 of the first year's plants, and sufficient of the second year's vine to make about 15 pounds when dry, were kindly donated. The growing plants were transplanted into the experimental garden and the following year's crop reserved for further study. It has since been learned that the seeds are very slow in germinating and must be sowed in a cool, moist soil. Self-sown seeds do not germinate as a rule until June of the following year.

In the present study the entire plant of the second year's growth was employed, no attempt being made to separate root from stem or leaves. The finely ground drug was treated exactly as outlined above. About thirty grams of a dirty gray mass of alkaloids was obtained, and after redissolving in dilute acetic acid, making alkaline with ammonia water and shaking out with ether, several different forms of crystals separated. They were separated as far as possible mechanically, and each one purified by many recrystallizations. Five distinct alkaloids were isolated by fractional crystallization, as follows:

ALKALOID 1. PROTOPINE.

The identity of this alkaloid was established in the preliminary examination which has been reported. It has the composition $C_{20}H_{19}NO_6$ and melts at 204–205° C.

ALKALOID 2. β -HOMOCHOLIDONINE.

This alkaloid crystallized in rather characteristic form, viz.: in beautiful clusters or rosettes of boat-shaped crystals with truncated ends. When purified the crystals melted at 159°. Sulphuric acid gives at once a rose pink color which is intensified when the vapor of nitric acid is blown over it. Erdmann's reagent colors it yellowish, passing into beautiful violet.

Combustions gave the following results:

	Found.		Calculated for
	I.	II.	$C_{21}H_{23}NO_8$.
C.....	68.66	68.6	68.27
H.....	6.2	6.9	6.24
N.....	3.8	3.76	3.8

ALKALOID 3. ADLUMINE.

This alkaloid constituted the principal portion of the entire or total alkaloid. After purification it melted at 188° C. It crystallizes easily and in beautiful large crystals. Chloroform and alcohol mixed constitutes the best crystallizing medium from which large colorless orthorhombic crystals can be obtained. The following color tests were obtained :

Sulphuric acid.....lemon yellow.
 Erdmann's reagent.....olive green to brown, then wine red.
 Nitric acid.....lemon yellow to orange.
 Marquis' reagent.....light yellow, changing to lavender.

A weighed quantity of desiccator-dried material lost no weight upon heating for several hours at 100° C. It therefore contains no water of crystallization. The material at hand permitted the following combustions for composition :

	Found.			Calculated for	Calculated for
	I.	II.	III.	$C_{20}H_{20}NO_{12}$	$C_{20}H_{41}NO_{12}$
C.....	65.95	65.77	65.45	65.62	65.45
H.....	5.75	5.64	5.59	5.46	5.74
N.....	2.08	2.18	2.02	1.97	1.96
O.....	26.22	26.41	26.94	26.95	26.85

From the above results alone it is impossible to determine with certainty whether the formula is $C_{20}H_{20}NO_{12}$ or $C_{20}H_{41}NO_{12}$, the difference of two atoms of hydrogen being difficult to adjust because of the size of the molecule.

Platinum chloride does not precipitate the alkaloid from its solution. Gold chloride throws down a copious yellow amorphous precipitate which can be crystallized by redissolving in hot water and allowing to cool. The crystals of the gold salt are deep orange-red in color, and contain no water of crystallization. During crystallization a part of the gold is reduced. Incineration of the gold salt did not furnish concordant results, as we were probably dealing with a mixture of reduced gold and gold salt. This reaction will be studied further when material is available.

Determination of Methoxyls.—Of the pure alkaloid .100 Gm. was treated according to the Zeissel method for the determination of methoxyls. An abundant precipitate of AgI was formed in the flask containing the $AgNO_3$ solution. This was transferred to a Gooch crucible, thoroughly washed, dried and weighed. The weight of AgI .847 Gm. is equivalent to 8.6 per cent. methoxyl, calculated from the formula having the higher hydrogen content. This is exactly equal to two methoxyl groups.

Determination of Hydroxyls.

A small amount of the pure alkaloid was heated with acetic anhydride on the steam bath for several hours and the solution then evaporated to dryness. The amber-colored residue was taken up with a little chloroform, alcohol added, and set aside. Colorless crystals, which melted at 177°C . when purified, separated quite rapidly.

Of this compound .1412 Gm. was saponified by boiling with freshly prepared $\text{Mg}(\text{OH})_2$ under reflux condenser for two hours. Upon cooling, the liquid was filtered, the precipitate thoroughly washed, all the washings combined and concentrated and the magnesia determined as $\text{Mg}_2\text{P}_2\text{O}_7$. The weight obtained was .0202 $\text{Mg}_2\text{P}_2\text{O}_7$, which is equivalent to 5.54 per cent. of the acetic radical. Theory requires 5.68 per cent. for one acetyl group based on the formula with higher molecular weight.

The compound is then written $\text{C}_{37}\text{H}_{34}(\text{OH})(\text{OCH}_3)_2\text{NO}_9$.

Finally this alkaloid, which we have named adlumine because it seems not to have been known before, rotates the plane of polarized light $[\alpha]_D = +39.88$.

ALKALOID 4. ADLUMIDINE.

This alkaloid crystallizes in small, almost colorless, square plates melting at 234°C . When perfectly pure it is colorless, but it is extremely difficult to remove the last traces of the yellow color which adheres to it. It also appears to be a new alkaloid and we have therefore named it adlumidine.

The quantity available was too small to permit of more than the following combustions :

	Found.		Calculated for
	I.	II.	$\text{C}_{30}\text{H}_{29}\text{NO}_9$.
C	65.69		65.6
H	5.6	5.1	5.3
N	2.6		2.54
O	26.11		26.5

The color reactions are quite striking.

Sulphuric acid bright red, changing to olive, brown, then pink.
 Erdmann's reagent brick red, changing to shades of green, to brown.
 Nitric acid orange to light yellow.
 Marquis' reagent bright red to dark brown, then purple violet.

ALKALOID 5. UNNAMED.

This alkaloid was found in such small quantity that only the melting-point, $176-177^{\circ}\text{C}$., and the color reactions could be determined.

Sulphuric acid light yellow.
 Erdmann's reagent ... dirty olive, brown, wine red.
 Nitric acid light yellow.
 Marquis' reagent no color.

ORGANIC ACIDS.

The dreg left after removing the alkaloids with chloroform was percolated with boiling water and the percolate concentrated to small volume. Upon cooling, a crystalline sediment accumulated in the bottom of the dish. This dark-colored deposit was collected on a Buchner filter and thoroughly washed with cold water. There was left a grayish granular mass of salts of ammonium and calcium. This mass was dissolved in hot water with the aid of a little acetic acid, and then precipitated with solution of lead subacetate. This precipitate was collected and rapidly washed with cold water by the aid of suction. The precipitate was suspended in water and decomposed with H_2S , the PbS removed by filtration and the filtrate evaporated to dryness. This was boiled with alcohol and filtered. From the filtrate a white precipitate separated on cooling, which was found to contain calcium. Calcium tartrate was suspected. It was dissolved in acetic acid and treated with ammoniacal silver nitrate solution, from which it deposited silver in the form of a mirror upon boiling. The free acid was precipitated by calcium hydrate in the cold (distinction from citric acid).

The residue left after treating with boiling alcohol was tested with ammoniacal silver nitrate solution, but did not precipitate silver and was not precipitated by calcium hydrate in the cold, though it was precipitated on heating.

The free acid was crystallized later and the rhombic prisms of citric acid identified.

SUMMARY.

Adlumia cirrhosa contains at least five distinct alkaloids as follows :

1. Protopine $C_{20}H_{19}NO_5$, melting point, 204° – 205° C.
2. β -Homochelidonine $C_{21}H_{23}NO_5$, melting point, 159° C.
3. Adlumine $C_{29}H_{39}NO_{13}$, or $C_{29}H_{41}NO_{12}$, melting point, 187 – 188° C.
4. Adlumidine $C_{20}H_{22}NO_9$, melting point, 234° C.
5. Unnamed, melting point, 176° – 177° C.

Also tartaric and citric acids.

The investigation is being continued.

School of Pharmacy, University of Michigan, Ann Arbor, Mich.

Mr. Kraemer moved to accept the paper and refer to the Publication Committee, and the motion prevailed.

Mr. H. M. Gordin then read the following paper in abstract :

THE QUANTITATIVE ESTIMATION OF STRYCHNINE IN MIXTURES OF STRYCHNINE AND BRUCINE.

BY H. M. GORDIN.

All the methods which have so far been proposed for the quantitative estimation of strychnine when mixed with brucine seem to lack either in

exactness or simplicity of operation. I have therefore set out to examine whether it is possible to devise a new method, or modify some old method, so that the results obtained by it will be both exact and the operations involved in the method simple.

At first sight it would seem that the simplest and most exact way of estimating both strychnine and brucine is to weigh the above mixture first and then titrate the alkaloids with standard acid, using some suitable indicator. By combining the gravimetric with the alkalimetric result, we could get the amounts of each of the alkaloids from two simple equations of the first degree.* Such a method would give absolutely exact results if it were only possible to obtain the mixture of the alkaloids in a state of absolute purity. But, unfortunately, in all pharmaceutical and toxicological work, even with the greatest care and best method of purification, it is impossible to obtain the alkaloidal mixture perfectly free from other matter, and an error of only one per cent. in the weight will vitiate entirely the results obtained from the two equations. Suppose, for example, the residue of total alkaloids obtained in an assay of *nux vomica*, owing to impurity, weighs 101 milligrams instead of 100 milligrams. Suppose, also, that this residue contains 50 milligrams strychnine and 50 milligrams brucine, the rest being impurities. If we combine the equations, we would get $x + y = a$ and $bx + cy = d$, where x is the amount of strychnine, y the amount of brucine, a the weight of the residue, b the number of Cc. of the standard acid required for one gram of strychnine, c the corresponding number of Cc. of the acid for one gram of brucine, and d the number of Cc. consumed by the residue. Working with a $\frac{N}{40}$ acid the result for strychnine would be 16 per cent. too low and for brucine 16 per cent. too high, as can be seen by a simple calculation. Such a method is certainly worthless.

Another very simple method for the estimation of strychnine when it is mixed with brucine was suggested by A. B. Lyons.† It consists in washing away the brucine by means of a saturated solution of strychnine in 40 per cent. alcohol and weighing the residual strychnine. On trying this method upon residues of chloroformic solutions containing known amounts of these alkaloids, it was found that though great care was taken to use a fully saturated solution of strychnine in 40 per cent. alcohol,‡ most of the strychnine was washed away along with the brucine. The reason of this must be that strychnine in the amorphous condition as it is generally obtained, on evaporating chloroformic solutions of mixtures of strychnine and brucine, is much more soluble in 40 per cent. alcohol than when the alkaloid is in

* This method was suggested by Schweissinger, *Am. Drug.*, 1885, 230.

† *Assay of Drugs*, 1899, 195.

‡ This was made by digesting an excess of finely powdered strychnine in 40 per cent. alcohol in a stoppered pressure-bottle six hours on the water-bath and filtering the liquid when cold.

the crystalline form. A solution might then be fully saturated with regard to the crystalline alkaloid and at the same time not at all saturated with regard to amorphous strychnine. It is also possible that the presence of brucine increases the solubility of strychnine.

Another simple method for the estimation of strychnine in presence of brucine was proposed by Beckurts and Holst.* It consists in titrating the alkaloids dissolved in water strongly acidulated with hydrochloric acid with standard potassium ferrocyanide, which precipitates the strychnine but leaves the brucine in solution. The end reaction is found by the blue color produced by a drop of the liquid upon paper moistened with a weak solution of ferric chloride as soon as all the strychnine is precipitated. This method, as shown by the analytical data given by the originators, gives very exact results, but owing to the inconvenience and tediousness of catching the end point, it has not come into general use.

Upon the same principle as Beckurts' method is based the well-known method of Dunstan and Short, adopted in the British Pharmacopœia. In this method the strychnine ferrocyanide is collected on a filter, and, after thorough washing with slightly acidulated water, decomposed by ammonia and the strychnine shaken out with chloroform. The objection to this method is that as was shown by Schweissingert† and Farr and Wright,‡ the strychnine ferrocyanide generally carries down more or less of brucine ferrocyanide, so that in order to obtain tolerably good results it is necessary that the alkaloids be present in definite amounts, a condition which we cannot control in assaying drugs, and that certain conditions of dilution, time of digestion with the potassium ferrocyanide, etc., must be strictly adhered to.

A method based upon an entirely different principle was proposed by Gerock.§ In this method the brucine is completely destroyed by nitric acid of a definite strength, which, under the given conditions, converts the brucine into non-alkaloidal compounds, and affects the strychnine only very little. As the picrates of these alkaloids behave towards nitric acid in the same way as the alkaloids themselves, Gerock precipitates them by picric acid, and after treating the combined picrates with dilute nitric acid (1.056) collects and weighs the unattacked strychnine picrate. As was shown by analytical data, the results obtained by this method are about 4 per cent. below the truth.|| The error then is not very large, and in the absence of a better method, Gerock's method could be recommended.

* Arch. d. Pharm. (3), xxv. 313.

† Am. Drug., 1885, 230.

‡ Trans. Brit. Pharm. Conf., 1900, 440; Proc. A. Ph. A., 1901, 883.

§ Arch. d. Pharm., 1889, 159.

|| In one experiment Gerock took 0.069 gram. strychnine, and found 0.063 gram.; in another experiment he took 0.048 and found 0.046.

The same is true even to a much greater extent of the method of C. C. Keller,* which is based upon the same principle as that of Gerock, but is much simpler, owing to the fact that the precipitation as picrates is left out altogether. In Keller's method the mixed alkaloids (about 0.3 gram.) are dissolved by the aid of water-bath heat in 10 Cc. dilute sulphuric acid (10 per cent.). To the liquid when cold 1 Cc. strong nitric acid (1.42) is added, and the mixture set aside for about an hour and a half. The liquid is then neutralized with ammonia, and the strychnine shaken out with chloroform-ether (equal parts). As the analytical data given by Keller relate to experiments upon each of the alkaloids separately, not upon mixtures of them, I decided to test the method upon mixtures of the pure alkaloids. The strychnine was repeatedly recrystallized from 90 per cent. alcohol until it had a sharp melting point of 266°C., and the brucine was recrystallized from absolute alcohol until it had a sharp melting point of 178° C.

1. Taken strychnine, 0.1181 Gm.; brucine, 0.1004 Gm. Found strychnine, 0.1130 Gm., or about 96 per cent.

2. Taken strychnine, 0.1006; brucine, 0.0989. Found strychnine, 0.0959, or again about 96 per cent.

As Keller's method is based upon a correct principle, and is very easily carried out, I decided to investigate whether it is possible to obtain better results by the method by avoiding certain sources of error, which as the above experiments show must be hidden in the method.

It is clear that the loss of about 4 per cent. of strychnine can only be accounted for by the action of the nitric acid upon the strychnine, which is more or less converted into trinitrophenol.† As this change in the strychnine is easily seen by the yellow color which the strychnine solutions assume on treatment with nitric acid, it was decided to find the conditions under which strychnine is not affected at all, so that its solution is not even colored, but the destruction of brucine is complete. This was done by digesting solutions of strychnine and brucine separately with different amounts of nitric acid of various strengths for various lengths of time until an amount of acid was found which completely destroys brucine, but within a given time does not even color a solution of strychnine. It was soon found that in Keller's method the time of digestion could be reduced to 5 minutes without causing the slightest change in the results. On digesting a solution of about 0.1 Gm. of brucine in 10 Cc. dilute sulphuric acid with one Cc. of nitric acid (1.42) for five minutes, the brucine was completely destroyed, which was shown by the method described below; on the other hand, on digesting a solution of strychnine (about 0.1 Gm.)

* Zeit. Oest. Apoth. Ver., 1893, 587.

† As was shown by many investigations before Gerock, and by the latter himself, strychnine is converted more or less into picric acid by the action of nitric acid. For literature on this subject, see Gerock, Arch. d. Pharm., 1889, 161.

in 10 Cc. diluted sulphuric acid (10 per cent.) with 1 Cc. of nitric acid of above strength for five minutes, the solution showed a decided yellow color, showing the formation of some trinitrophenol. Though it takes very little of the latter compound to produce a yellow color, the fact that in Keller's method, as shown above, there is a loss of about 4 per cent. of strychnine, seems to show that in Keller's method the decomposition of this alkaloid at least is of the extent of 4 per cent.

After repeated trials it was found that if to a solution of about 0.1 to 0.2 Gm. of brucine in 15 Cc. of 3 per cent. sulphuric acid, 3 Cc. of a previously prepared and cooled mixture of equal volumes concentrated nitric acid (1.42), and water be added, and the mixture shaken occasionally during 10 minutes, the brucine is completely destroyed. This was shown by shaking out the above mixture after ten minutes' digestion with the acid with chloroform after the addition of an excess of ammonia. The chloroform solution was then shaken out with acidulated water, and the aqueous solution thus obtained tested for brucine. Neither picric acid, nor Mayer's reagent, nor Wagner's reagent, gave the slightest turbidity. The liquid was also perfectly free from any bitter taste. On the other hand, on adding to a solution of about 0.1 to 0.2 Gm. of strychnine in 15 Cc., 3 per cent. sulphuric acid, the same amount of the nitric acid and water mixture as was used above for brucine, and shaking the liquid occasionally during 15 minutes, no trace of yellow color could be observed in the liquid. These conditions then must be adhered to in order to decompose completely the brucine without affecting the strychnine.

Another improvement in the method consists in substituting a fixed alkali for the ammonia and pure chloroform for ether-chloroform. If ammonia be used the residual strychnine is more or less colored, no matter whether chloroform alone or a mixture of ether and chloroform be used for shaking out the strychnine. But if sodium hydroxide and chloroform alone be used the resulting chloroformic solution is perfectly colorless and the residual strychnine is almost snow white. The reason that ammonia is generally preferred in shaking out alkaloids by means of immiscible solvents is that owing to its volatility no trace of alkali is left in the residual alkaloid, a circumstance which is of the greatest importance when the isolated alkaloid is estimated alkalimetrically, in which case to a small amount of alkali corresponds a large amount of alkaloid. This is perfectly true when the immiscible solvent used is either ether alone or a mixture of ether and chloroform in various proportions. Owing to the solubility of water in ether some of the water is taken up by the ethereal liquid, and along with the water some alkali also goes over into the ether or the ether-chloroform layer. But the case is entirely different when chloroform alone or petroleum ether alone is used as the immiscible solvent. In this case no trace of fixed alkali goes into the immiscible solvent. This can be shown by shaking out 20 Cc. dilute solution of sodium hydroxide three times

with chloroform or petroleum ether, using 20 or 25 Cc. of the immiscible solvent each time. If the chloroform or the petroleum ether be now filtered through a double filter and then shaken up with water, no trace of alkalinity will be found in the latter by means of phenolphthalein or any other indicator.* In the separation of strychnine from brucine we can therefore use a fixed alkali and chloroform without fearing that some fixed alkali will contaminate the residual strychnine.

Introducing all these modifications into Keller's method I have worked out the following method which is simple, quick and very exact. The details of my method of separating strychnine from brucine are as follows:

The mixed alkaloids, for example, the residue of total alkaloids obtained in the assay of *nux vomica* from 8 or 10 grams of drug, are dissolved in 15 Cc. 3 per cent. sulphuric acid by the aid of water-bath heat, the solution is cooled to ordinary temperature and 3 Cc. of a previously prepared and cooled mixture of equal parts of strong nitric acid (sp. gr. 1.42) and water added to the alkaloidal solution. The liquid is set aside for exactly 10 minutes, shaking it gently three or four times during this time. The red liquid is now transferred to a separator containing 20 or 25 Cc. of 10 per cent. sodium hydroxide solution,† and the vessel in which the digestion of the alkaloids had taken place is washed three or four times with very small amounts of water. The liquid in the separator will now be very turbid from the separation of strychnine. If this is not the case, there is not enough alkali, and a further addition of one or two Cc. alkali must be made. After the addition of sufficient alkali the liquid is shaken out three times, with chloroform, using 20 Cc. for the first shaking out and 10 Cc. each time for the two subsequent ones. The chloroformic solution is filtered through a small plain double filter arranged so that there are four folds of paper on each side into a light tared flask, taking care to wash the stem of the separator with a little chloroform; the filter and stem of the funnel are also washed a few times with small amounts of chloroform, and to the perfectly colorless solution of strychnine thus obtained are added two or three Cc. of pure amyl alcohol which distills between 128 and 132° C., and leaves no residue on evaporation.‡ The chloroform is now distilled off completely and the small amount of amyl alcohol left behind removed by keeping the vessel on the water-bath and blowing air over its opening, but so as not to blow out some alkaloid by the air current. The vessel is now dried for about two hours at a temperature of 135° to 140° C., and when cold weighed.

* This principle can be made use of in the assay of many drugs, as I will show later on.

† It is best to place the alkali in the separator while the alkaloids are being digested with the acids so that after the lapse of ten minutes, when the acid liquid is poured into the separator, the action of nitric acid upon the strychnine is quickly arrested.

‡ The amyl alcohol prevents very effectively the decrepitation of strychnine which unavoidably occurs on the removal of the last traces of chloroform by heat. See F. C. J. Bird, *Pharm. J. Tr.*, Sept. 8, 1900, 286.

How very exact the results obtained by this method are can be seen from the following table. In verifying the results given in the table, care should be taken to use strychnine free from brucine and brucine free from strychnine. It is self-evident that otherwise the results will be either too low or too high. The pure alkaloids are easily obtained by a few recrystallizations from 90 per cent. alcohol for strychnine and absolute alcohol for brucine. In the table below the amount of brucine is not given. It was taken in indefinite quantities by the aid of a narrow glass tube holding between 0.1 to 0.2 gram of the alkaloid.

	Strychnine taken.	Found.
1	0.1325	0.1330
2	0.1406	0.1411
3	0.1009	0.1010
4	0.1199	0.1201

The strychnine obtained in this method is very pure and can be easily titrated with standard acid, using hematoxylin as indicator. Though this would shorten the estimation by avoiding the two hours' drying, I nevertheless prefer the gravimetric method to the alkalimetric one when the alkaloid obtained is of such exceptional purity as in this case.

In a later paper I will show how to apply this method to the assay of nux vomica or ignatia bean.*

Mr. Caspari, seconded by Mr. Searby, moved to receive the paper and refer for publication. Carried.

MR. CASPARI: I want to say a few words in this connection. It was my good fortune to have this paper in my hands before the meeting. As General Secretary, all papers that are printed pass through my hands, and when I put my eyes on this one I became intensely interested. I have used Gerock's, Keller's, and the British ferrocyanide methods in this work, but all proved more or less unsatisfactory. When I read the process suggested by Mr. Gordin I had it put to trial immediately, and I want to say it gave us better results than we ever had before. We feel that we can rely more on this method now, than on any we have tried. If found equally successful by other analysts, it will probably be adopted by the Committee of Revision of the Pharmacopœia. I am delighted that Mr. Gordin has worked on this problem, and I want to thank him for those who have to do with assay work. It is a feather in his cap, but a still greater one in ours. It will save an immense amount of work if this method proves as satisfactory with others as it has with me. [Applause.]

MR. HALLBERG: I would like to ask Mr. Gordin what the relative toxicity of brucine and strychnine is. Some claim that the brucine is comparatively inert, and some that it is as poisonous as strychnine.

* After this article was almost finished, Dr. Lyons published another method of separation of strychnine from brucine, based upon washing away the brucine by means of a saturated solution of strychnine sulphate. Pharm. Rev., 1902, 253. But as Dr. Lyons himself does not claim any great exactness for this method, it is not necessary to discuss it here.

MR. GORDIN: I have not made personal experiments to decide that matter, but all agree that brucine is far less active than strychnine. It is not a question of twice less active, but according to one authority it is thirteen times, and according to another over thirty-three times less active than strychnine. Brucine is comparatively inactive, in comparison with strychnine. But personally I do not know about it, because I have not made the experiment to see.

MR. LYONS: I have made some experiments, but have not carried them far enough to write a paper on the subject. My results so far show a difference of at least thirty times.

THE CHAIRMAN: Without further discussion on the paper it will take the usual course, and I will ask Mr. Gordin to read his other paper on examination of podophyllin.

Mr. Gordin then presented the following paper in abstract, receiving the applause of his audience :

EXAMINATION OF PODOPHYLLIN.

BY H. M. GORDIN AND C. G. MERRELL.

Though the chemistry of podophyllin has been fairly well cleared up by the investigations of Podwysotzky,* Kürsten† and Dunstan and Henry,‡ no attempt has been made to work out an exact assay method for this very important drug. How very desirable an assay method for podophyllin would be, can be seen from the fact that different samples of the resin made by different manufacturers and sold as pure podophyllin, differ from each other not only in external appearance, but also in behavior towards various solvents like alcohol, ether and chloroform. A difference in appearance could be explained by a difference in the temperature of drying the resin, but differences in solubility in certain solvents must certainly indicate difference in composition.

In order to show the different behavior of the different "pure" podophyllins on the market towards solvents, five samples of the resin were purchased from as many reputable manufacturers and examined as given below.

In order to have a standard for comparison we made a sample of podophyllin ourselves by exhausting some mandrake with alcohol, concentrating the extract to a very thin syrup and throwing it into ice-cold water containing about one-third of one per cent. of absolute hydrochloric acid. The resin was collected, thoroughly washed and dried in vacuo over sulphuric acid. This sample was labeled 1. The purchased samples were labeled 2, 3, 4, 5 and 6.

SOLUBILITY IN ALCOHOL.

The first examination was with regard to solubility in alcohol. It was

* Pharm. J. Tran., 1882, 217 and 1011.

† Arch. d. Pharm., 229, 220.

‡ Proc. Chem. Soc., March, 1898.

found that all samples except 3 and 4 dissolved completely in twice their weight of alcohol. To estimate the amount of alcohol-soluble matter in the samples 3 and 4, definite quantities of these samples were digested 24 hours with about 50 times their weight of alcohol with frequent shaking. The mixture was then made up to 100 c.c., filtered, and in 50 c.c. of the clear filtrate the residue estimated by distilling off the alcohol from a tared flask, drying at 100° C. and weighing.*

Sample.	Amount taken.	Residue left from $\frac{1}{2}$.	Per cent. of alcohol-soluble matter.
3.....	1.231	0.5637	91.6
3.....	1.08	0.4931	91.3
4.....	1.4328	0.657	91.6
4.....	1.0488	0.4852	92.5

It is evident that these two samples contained some other substances besides podophyllin. As to the amount of adulteration it would not be right to suppose that the samples contained about 91.5 per cent. pure podophyllin, for the reason that it is very easy to adulterate podophyllin with other resins which are also soluble in alcohol. That the samples 3 and 4 really contained much less than 91 per cent. pure podophyllin will be shown further in this article.

2. SOLUBILITY IN AMMONIA WATER.

On digesting small amounts of the different samples with weak (about 2 per cent.) ammonia water, the samples did not all dissolve completely at first, but on standing over night all went into solution, showing that by the aid of ammonia we cannot detect adulterations in podophyllin.

3. SOLUBILITY IN ETHER AND CHLOROFORM.

For the estimation of the amounts soluble in these solvents, two grams of each sample were digested, with frequent shaking, twenty-four hours with about 100 grams of ether or chloroform respectively; the liquid was then filtered through a tared filter previously washed with these solvents, the insoluble residue thoroughly washed with the solvent, the filter and residue dried at 100° C. and weighed in a stoppered bottle.

With sample three it was impossible to carry out the estimation of the ether-soluble part by this method, as the part insoluble in this solvent was not solid but a thick liquid which clogged the filter. In this sample the filtrate was therefore collected in a tared flask, the ether distilled off, the flask dried at 100° C. and weighed.

By deducting the weight of each residue from 2, the amount soluble in these solvents was obtained. The amounts found are given in the table below :

* It would have been more exact to collect the insoluble residue upon a filter and wash it with alcohol until completely exhausted, but on trial it was found that the alcohol would not pass through the filter.

Sample.	Taken		Found		Per cent. soluble	
	For Ether.	For CHCl ₃ .	For Ether.	For CHCl ₃ .	In Ether.	In CHCl ₃ .
1.....	2 gm.	2 Gm.	1.346 gm.	1.5126 gm.	67.30	75.63
1.....	"	"	1.349 "	1.5082 "	67.45	75.41
2.....	"	"	1.3132 "	1.4348 "	65.66	71.74
2.....	"	"	1.2946 "	1.4296 "	64.73	71.48
3.....	"	"	0.9432 "	0.9136 "	47.16	45.68
3.....	"	"	0.9428 "	0.9174 "	47.14	45.87
4.....	"	"	0.9276 "	1.0621 "	46.38	53.10
4.....	"	"	0.9280 "	1.0701 "	46.40	53.50
5.....	"	"	1.2031 "	1.5002 "	60.15	75.01
5.....	"	"	1.2045 "	1.5120 "	60.22	75.60
6.....	"	"	1.3023 "	1.4981 "	65.11	74.90
6.....	"	"	1.3001 "	1.4893 "	65.01	74.46

It will be seen from the table that the amount soluble in ether or chloroform is highest in 1 (standard) and lowest in 3 and 4, and therefore the difference in solubilities in ether and chloroform between the purchased samples and the standard is greatest in 3 and 4. Of the purchased samples 6 approached the standard nearer than any other.

If the solubility in ether of sample 1 be taken as a standard, then sample 3 contained only about 70 per cent. and sample 4 contained only about 69 per cent. of pure podophyllin. If the solubility in chloroform of sample 1 be taken as a standard, then sample 3 contained about 60 per cent. and sample 4 contained about 70 per cent. of pure podophyllin. From this it can be seen that though about 92 per cent. of these two samples 3 and 4 was soluble in alcohol, the samples must have contained much less than that of pure podophyllin.

4. ESTIMATION OF CRUDE PICROPODOPHYLLIN.

Owing to the fact that podophyllotoxin is regarded as the chief active principle of podophyllin, the best way to assay the latter would be to estimate the amount of podophyllotoxin in it. Unfortunately, there is no convenient method for the quantitative isolation of pure podophyllotoxin from podophyllin. The method which has been suggested by some and which consists in exhausting podophyllin with chloroform and throwing the extract into petroleum ether, gives entirely erroneous results. That chloroform extracts not only podophyllotoxin, but many other substances, can be seen from the table given above, where in some cases the amount extracted by this solvent was as high as 75.6 per cent., whereas, according to the researches of Dunstan and Henry,* podophyllin never contains more than about 20 per cent. of pure podophyllotoxin.

On the other hand, when the chloroform extract of podophyllin is thrown into petroleum ether, the podophyllotoxin that is precipitated is mixed with a very large amount of other matter. To show this, 5 grams of sample

* Loc. cit.

1 were placed into a filter paper cell and exhausted in a Soxhlet with chloroform for three hours. Most of the chloroform was distilled off and the rest thrown into ten times its volume of petroleum ether. The precipitate was collected, washed thoroughly with petroleum ether, dried at about 50° C. and weighed on a tared filter. The weight obtained was 2.0615 grams or 41.23 per cent.

The best method for the estimation of podophyllotoxin in podophyllin is to convert it into its isomer picropodophyllin by means of alcoholic calcium hydrate, extract the picropodophyllin by a suitable solvent, evaporate the solvent and weigh the residue. The quantitative conversion of podophyllotoxin into picropodophyllin is very easily accomplished by dissolving the podophyllin in very little alcohol and adding an amount of calcium hydrate equal to about twice the weight of the podophyllin taken. In a short while the mass becomes solid, and hot alcohol, hot benzene or hot chloroform extracts almost nothing but picropodophyllin. This can be shown by extracting the mass with the above-mentioned solvents with the aid of heat, evaporating to dryness and taking up the residue with a little hot alcohol. If 15 or 20 grams of podophyllin be operated upon, the picropodophyllin separates out on cooling in one crystalline mass and the liquid remains almost colorless. When the picropodophyllin refuses to crystallize out it can be made to do so by shaking the vessel for ten or fifteen minutes. Owing to the difficult solubility of picropodophyllin in cold solvents, it was thought that an estimation of picropodophyllin in podophyllin could be made by exhausting the mixture of lime and podophyllin by hot solvents, cooling, collecting the picropodophyllin which separates out, drying it and weighing. On trial it was found that though crystallized picropodophyllin requires 327 parts of cold alcohol for solution,* the presence of even very small amounts of resinous matter greatly increases this solubility. The isolation of the picropodophyllin can, therefore, not be carried out with desirable exactness, but the amount of crude picropodophyllin can be found without difficulty.

The way to operate is as follows: Weigh out 5 grams of podophyllin into a strong round bottle holding about 200 Cc., add to it about 10 grams freshly prepared calcium hydrate, stopper the bottle with a good cork and weigh the whole. Now uncork the bottle and put it into a water-bath heated to 60–65° C. for a few minutes, then pour in 15 Cc. alcohol, stopper the bottle, shake well, replace the bottle in the water bath and keep it there stoppered for eight hours, shaking at first every few minutes to prevent formation of a hard lump. After half an hour it is only necessary to shake the mixture about every quarter of an hour. After the lapse of eight hours the bottle is cooled and about 7 Cc. chloroform added to its

* This was established by shaking for twenty-four hours an excess of pure picropodophyllin with 50 Cc. alcohol, filtering off 25 Cc. into a tared vessel, evaporating, drying and weighing. The 25 Cc. dissolved 0.0764 gram.

contents. The bottle is now placed on the balance and an amount of a mixture of two parts alcohol and one part chloroform (by volume) is poured into the bottle to make the whole liquid added weigh 130 grams. The bottle is shaken a few minutes and set aside until the supernatant liquid becomes perfectly clear, which takes about 24 to 48 hours. Sixty-five grams of the clear liquid are now drawn off* into a tared vessel, the liquid removed by distillation and the residue dried and weighed.

This method of estimation was applied to the various samples and the following results were obtained :

Sample.	Amount taken.	Crude picropodophyllin found in $\frac{1}{2}$.	Per cent.
1	5 Gm.	0.5728	22.91
1	"	0.5710	22.84
2	"	0.5146	20.58
2	"	0.5208	20.83
3	"	0.4269	17.08
3	"	0.4209	16.84
4	"	0.3996	15.98
4	"	0.3981	15.92
5	"	0.5381	21.52
5	"	0.5302	21.21
6	"	0.5681	22.72
6	"	0.5657	22.63

In applying the method to different samples of podophyllin it is necessary to always use the same amount of solvent, as otherwise various amounts of impurities are liable to be extracted along with the picropodophyllin by the various amounts of solvent. It will again be seen that samples 3 and 4 differed more than the rest from sample 1, and that if the amount of crude picropodophyllin as extracted by the method here given be taken as a standard then 3 contains about 74 per cent. and 4 about 70 per cent. of pure podophyllin.

CONCLUSION.

It follows from these experiments that though we have no means at present to isolate quantitatively the active principle or principles of podophyllin, we can without difficulty tell whether a given sample of podophyllin is adulterated to a considerable extent or not. If we put up the following requirements for *pure* podophyllin it would be very difficult for an unscrupulous manufacturer to adulterate the resin so skillfully that the product will answer all the following requirements. It would, for example, be easy to adulterate podophyllin with another alcohol-soluble substance, or an ether-soluble substance, etc., but it is hardly possible to find a substance that will behave toward the following requirements exactly like podophyllin. These requirements are as follows :

* This is best accomplished by placing the tared vessel upon the balance and forcing the picropodophyllin solution into this vessel by means of an arrangement similar to a Spritz bottle fitted to the bottle in which the podophyllin is digested.

1. Pure podophyllin must be completely soluble in about twice its weight of cold alcohol.
2. It should contain about 64 per cent. ether-soluble and about 74 per cent. chloroform-soluble matter.
3. It should yield about 22 per cent. crude picropodophyllin when assayed by the method here described.

Before putting such requirements into the Pharmacopœia it would be advisable to prepare podophyllin from different samples of mandrake root, subject the different podophyllins so obtained to such an examination as here described, and in this way establish a mean value for ether and chloroform-soluble part, as well as for the amount of crude picropodophyllin which should be contained in this very important drug.

Cincinnati, Ohio, July, 1902.

Mr. Caspari, saying that he had no doubt the Committee of Revision of the Pharmacopœia would take cognizance of any work done in this direction, moved to accept the paper just read, and it was so ordered.

Mr. Wilbert then read in abstract his paper upon tincture of aconite as follows, being applauded upon his presentation of his subject :

TINCTURE OF ACONITE.

M. I. WILBERT, APOTHECARY AT THE GERMAN HOSPITAL, PHILADELPHIA.

With the possible exception of belladonna and digitalis, the most important vegetable drug of European origin is aconite. This drug, while known to the ancient Greeks and Romans as an active acrid poison, appears to owe its introduction into our materia medica to Baron A. Von Stœrck, of Vienna, who about 1760 appears to have made a series of physiologic and therapeutic observations, and was the first to positively recommend aconite as having medicinal value. It was nearly one hundred years later, however, before its use had been firmly established, and its medicinal value generally acknowledged.

This delay was largely due to the fact that Stœrck himself had recommended the use of the herb, and not having accurately described the particular species of aconite that he had used, there had been some difference of opinion as to its identity. In this connection it might be interesting to note that the Pharmacopœia of the Massachusetts Medical Society, as well as the first two editions of the United States Pharmacopœia, designate what is now hardly admitted to be a variety of *Aconitum napellus*, *Aconitum neomontanum*, as the only source of the active drug.

The popularity of aconite at the present time is evidenced by the fact that it is incorporated in 15 European Pharmacopœias, no less than 11 of these having formulas for a tincture of the root.

Aconite root was not introduced into our own Pharmacopœia until 1850, in which edition we also find a formula for the tincture of the same. This

tincture of the root is generally acknowledged to be by far the most desirable and efficient preparation of aconite. Even the alkaloid, differing as it does in composition, dose and price, cannot be considered a reliable medicinal agent at the present time.

Our own official tincture, however, suffers from the very serious objection of being dangerously potent. It is generally conceded that the most desirable way of giving a preparation of aconite is in minute doses, frequently repeated. The average minimum dose of U. S. P. tincture of aconite root is 0.03 Cc. or about half a drop: this is not a convenient quantity to measure out, and consequently this preparation is frequently directed to be diluted with water, not a very suitable diluent for a tincture made with 70 per cent. alcohol.

Another argument against the present strength of tincture of aconite is shown in Table No. 1, in which are enumerated the various tinctures of aconite root, official in the different Pharmacopœias. In the last column of this table we have included some data from the report of the Surgeon-General of the U. S. Navy, showing the increase in number of the Pharmacopœias that have a formula for tincture of aconite root, and also the general tendency to reduce the amount of the contained drug, where any change has been made.

TABLE NO. 1.—ILLUSTRATING THE VARIATION IN STRENGTH OF THE VARIOUS OFFICIAL TINCTURES OF ACONITE ROOT. 1902.

Pharmacopœia of	Per cent. of Drug.	Menstruum.	1881. Per cent. of Drug.
United States	35	70 per cent. Alcohol.	40
France	20	Diluted Alcohol.	
Hungary	20	70 per cent. Alcohol.	20
Portugal	20	65 per cent. Alcohol.	20
Germany	10	Diluted Alcohol.	10
Austria	10	Diluted Alcohol.	20
Italy	10	Diluted Alcohol.	
Russia	10	Diluted Alcohol.	10
Roumania	10	70 per cent. Alcohol.	
Holland	10	Diluted Alcohol.	
Switzerland	10	{ Alcohol, 1 per cent. Tar- taric Acid.	
Great Britain	5		15

The data given in this table is largely taken from the new (1902) edition of the "Universal Pharmacopœia," with the exception of the last column; this, as is noted above, is taken from a report of the Surgeon-General of the U. S. Navy.

It will readily be seen that at the present time the United States Pharmacopœia preparation is seven times stronger than that of the British, three and a half times stronger than the German, and nearly double the strength of that in the French Pharmacopœia.

That this excessive strength has been recognized as being a drawback, is illustrated by Table No. 2. This table shows, in round numbers, the different per cent. content of the drug in the tincture of the root as used in this country, and also illustrates the discrepancy in the strength of this tincture at the time it was introduced into the United States Pharmacopœia. The older formulas are taken from the American Journal of Pharmacy, Pereira's Materia Medica, and Hollembaek's Eclectic Materia Medica, all of them authoritative in their time.

TABLE NO. 2.—SHOWING STRENGTH OF TINCTURE OF ACONITE ROOT IN THE UNITED STATES.

Source or Name of Formula.	Per cent of drug.	Menstruum.
Fleming's Tincture.....	65	Alcohol.
Fleming's Tincture.....	60	Alcohol.
Turnbull's Tincture.....	37.5	Alcohol.
Eclectic Tincture.....	25	Alcohol.
Dublin College Pharmacopœia.....	50	Alcohol.
U. S. P., 1850.....	50	Alcohol.
U. S. P., 1860.....	40	Alcohol.
U. S. P., 1870.....	40	Alcohol.
U. S. P., 1880.....	40	{ Alcohol.
U. S. P., 1890.....	35	{ 0.4 per cent. Tartaric Acid.
		70 per cent. Alcohol.

It will be seen that in fifty years the official, or rather popular, tincture of aconite root has been reduced nearly 50 per cent. in drug strength.

At the present time, however, there appears to be no tangible reason why this tincture should not be materially reduced in drug content, so as to bring it more in harmony with the same tincture official in foreign Pharmacopœias, and also make it conform with other tinctures of narcotic or active drugs in our own Pharmacopœia. In Table 3, we have enumerated some of the more active tinctures of the United States Pharmacopœia, giving their drug content and the average doses.

TABLE NO. 3.—LIST OF NARCOTIC TINCTURES, PER CENT. OF DRUG AND THEIR AVERAGE DOSES.

Tincture of	Per Cent. of Drug.	Average Doses.
Aconite.....	35	0.03 to 0.20 Cc.
Belladonna.....	15	0.10 to 0.50 "
Cannabis Indica.....	15	0.50 to 2.00 "
Colchicum seed.....	15	0.50 to 2.00 "
Digitalis.....	15	0.20 to 1.00 "
Gelsemium.....	15	0.10 to 0.50 "
Hyoscyamus.....	15	0.50 to 2.00 "
Lobelia.....	20	0.50 to 2.00 "
Opium.....	10	0.30 to 1.50 "
Stramonium seed.....	15	0.30 to 1.50 "
Veratrum Viride.....	40	0.05 to 0.50 "

A careful study of this table will suggest the logical position for tincture of aconite. It will be seen that if this tincture was reduced to the same drug content as tincture of belladonna it could be given in the same dose. This would be an advantage in facilitating the acquisition of a knowledge of doses of these active tinctures. In addition to this a tincture of aconite containing 15 per cent. of drug, would be intermediate between the tinctures of the German and French Pharmacopœias. This is an important fact to remember, as we cannot at present, without being criticised severely, ignore the contents of foreign authoritative works. The world is rapidly growing smaller, steam and electricity are annihilating space, and what was foreign ten years ago is practically ours to-day. This is especially true of medical knowledge and medical practices. The policy of a Pharmacopœia should be to facilitate free intercourse or exchange of scientific knowledge and experience, instead of hampering it with annoying differences.

It would appear reasonable, therefore, that if the policy of our Pharmacopœia is to tend, as much as possible, to uniformity with the practices of foreign works of this kind, that a decided change in the strength of tincture of aconite would be a step in the right direction.

The fear of any possible serious accident resulting from a radical change at this time would be discounted when we remember the facility with which wide publicity could be given to an alteration of this kind. Over and above this, it would be preposterous to suppose that the pharmacists of the country are not sufficiently wide-awake to realize the importance of safeguarding their customers in case a change was made. As for the facility with which the change could be effected, we should remember that there are probably few pharmacists who would not be willing to double their stock of any preparation by the simple addition of alcohol and water. One decided advantage of this proposed change would be that it would give a much greater margin between the medicinal and the lethal dose.

Mr. Kraemer moved to refer the paper to the Publication Committee, and it was so ordered.

MR. HALLBERG: This is a very important paper. Mr. Wilbert recommends that tincture of aconite be reduced to one-fourth its strength, and it seems to me the druggists should be heard from. I believe I would favor a ten per cent. tincture of aconite, if it were not for the extreme danger involved in that step. The physician might prescribe tincture of aconite of the official strength of ten per cent., and the pharmacist might dispense it of the present thirty-five per cent. strength, which of course would lead to serious results. And still it is the only drug, except *veratrum viride*, that is of so high a percentage of strength. Measured in potency, it should not be more than ten per cent. in strength, and I would favor on the whole, I believe, reducing it to ten per cent. We have the fluid extract for a concentrated preparation. I would not, however, favor a ten per cent. strength for tincture of aconite unless a synonym was adopted for it—a synonym suggesting the strength of the tincture. The synonym *deture*, or *deciture*, instead of *tincture*, I would suggest, which would indicate a strength of ten per cent.

Then if we could educate the physicians up to the point of prescribing *deture*, the pharmacist, even if he had the present official tincture, would not be likely to dispense it for the *deture*. This is an important question, and the Committee of Revision has wrestled with the proposition considerably during the last year.

MR. HYNSON: I would like to ask Mr. Wilbert whether he advocates the change in strength on account of getting a better preparation, or because of its inconvenient strength.

MR. WILBERT: Because it is dangerously and unnecessarily strong, tincture of aconite is usually given in small quantities and often repeated. The usual practice with physicians is to give tincture of aconite in drop doses. The average minimum dose is about half a drop, and to measure that is rather a difficult thing. If the strength were reduced the size of the minimum dose could be increased to a drop, say, and run up from that. It would be a much better preparation, and would be easier to make—less excuse for not extracting the drug. As to the question of the danger of reducing the strength of tincture of aconite, if at the present time the American pharmacists are not capable of following the Pharmacopœia, and if the drug journals and the lay press of this country cannot disseminate information of that kind rapidly enough and get it to the most remote quarters of the United States, then it is dangerous to make *any* changes in the Pharmacopœia—we should take the Pharmacopœia as it is and adhere to it, no matter what happens. But if the average pharmacist is intelligent enough to follow the Pharmacopœia and the literature published in the Pharmacopœia, then I say there is absolutely no danger in reducing the strength of the tincture of aconite one half. Another object in reducing it is that in three of the larger countries of Europe the strength is 20 per cent.; in the majority of the others it is 10 per cent. So if we reduce it to be in keeping with our other tinctures to 15 per cent., the average dose either way would not matter materially; and the man who goes abroad to study medicine—and many of our medical students go, following the post-graduate course—and come back filled with the knowledge he gets on the other side, would find the strength of the drug here to coincide with that existing abroad, and there would be less danger.

MR. ECCLES: I cannot conceive of any possible danger from lowering the strength, for the following reason: I do not think you can change the average doctor in less than fifty years; I speak from experience. When the doctor has once left college, it is the rarest thing in the world for him to change in his prescribing. He keeps it up just the same; that is the rule. I meet this fact constantly in the medical societies all over the country. The doctor does not keep track of what is going on like the pharmacist. But you will find *pharmacists* in the City of New York that don't know anything about the Pharmacopœia, and probably never saw one.

MR. HYNSON: I think the reason we have so much respect for the buzz-saw is because *it is* a buzz-saw; and I don't believe by weakening a preparation of that kind, known to be dangerous, we make it less so. When we know its strength we handle it more carefully. It seems to me that, while we all like to be progressive, in this case it will serve no good purpose to change the strength of aconite unless we change the strength of all the tinctures and make them uniform.

MR. LYONS: I hardly think that Dr. Eccles has greatly exaggerated when he says it takes the physician fifty years to make a change in a matter like this. I think it would be safe to say twenty-five years. The danger would be with the pharmacist. The pharmacist would not know what was prescribed if the strength of tincture of aconite should be reduced from 35 to 10 per cent.; he would know that a change had been made, but he would not know what was prescribed, whether the old or new tincture. Tincture of

aconite will be prescribed for the next fifty years, and it will be dangerous for us to make a radical change in the strength. But we might leave it out of the Pharmacopœia until it is forgotten, and then if we want it back at some time in the future we can reintroduce it if desirable.

MR. CASPARI: It may not be out of place, in this connection, to recall a recent discussion in the Committee of Revision of the Pharmacopœia on this subject. I do not think any confidence is being violated in making the statement. It was suggested by some of the medical gentlemen on the committee that tincture of aconite be left out, because we have the fluid extract, a preparation far more dangerous. I distinctly remember making the point with the committee that we should leave it in the Pharmacopœia because the medical profession knew its strength. And I really hope now that tincture of aconite is not going to be reduced. I do not think it would be a good move to advocate that. In the last Pharmacopœia we did reduce it a little, but the committee only went from 40 to 35 per cent. They were very careful. They all felt at that time it was best to keep it as near the former strength as possible. But they recognized some desire for reduction, and put it at 35. This is a potent remedy, it is true, but physicians are careful in its use, and pharmacists know its potent character; the students, also, are instructed on the subject. I think it would be a bad move to reduce it, and particularly to throw it out entirely.

MR. WILBERT: There are very few physicians in this country who use fluid extracts, unless they dispense them themselves. Out of the 87 in the Pharmacopœia, less than 20 are used on prescription by the average physician. The majority of the fluid extracts—fluid extract of aconite among them—are used by the pharmacists to make tinctures. As far as tincture of aconite is concerned, it is made with a strong alcohol. The doctor prescribes it—drop a certain number of drops in water, and let the patient take a teaspoonful every half hour or hour. With children that is a dangerous practice. To dilute the tincture made with strong alcohol with water is apt to cause some precipitation, and after twenty-four hours who knows what is at the bottom of it? The mother is apt to give it without stirring it up, and when she gets to the bottom of the glass it is dangerous.

MR. STEVENS: I do not think there would be much danger after twenty-four hours. But we cannot decrease it, I think. If it takes fifty years to change the doctor, it takes at least half that time to change the pharmacist. I have gone into stores and found that they did not have anything on the subject of pharmacy under twenty years old.

THE CHAIRMAN: The tendency of the times towards uniformity is shown by the fact that on the 15th of September there is to be an International Convention in Brussels in regard to potent remedies, and Dr. H. C. Wood and Dr. F. B. Power have been appointed delegates by Mr. Hay, the Secretary of State at Washington. The tendency is that way, continually.

The Chair would like to say that he does not intend to cut off any discussion at all, but we want to get through these papers as rapidly as possible. The large number of papers, and the fact that we have but two sessions assigned us, requires us to be rapid in our work.

MR. KRAEMER: It seems to me this whole matter hinges on the question of assay of the drug. Not long ago, in New York City. I think—I suppose some of you are perfectly familiar with the incident—a firm had a lawsuit on hand because it dispensed an aconite preparation containing one per cent. of aconitine, or whatever alkaloid it was; and a physician who had been prescribing lower strengths got this strength of tincture of aconite in this store, and it caused serious consequences. It seems to me it is a most important subject, and that it hinges on that point of assay more than any other.

MR. ARNY: I wish to call attention to a case which occurred in Cleveland, which had fatal results. A physician, thinking he was going to save a poor patient some expense, wrote a prescription for a half ounce of tincture of aconite for a child, and directed that the pharmacist should put on the label that 10 drops were to be put in a glass of water and then a teaspoonful taken, and repeat in half an hour. It was given to an ignorant woman. The druggist was a well-known pharmacist, and the preparation was dispensed exactly as directed. The woman took the prescription and put the ten drops in a glass of water as directed. The result was not accomplished immediately, so in the course of half an hour she gave the child a teaspoonful of the *tincture of aconite*. The result was the child died, and the physician in the attempt to save the patient the price of a six-ounce mixture properly diluted, had the death of the child to contemplate, and probably an undertaker's bill to pay. This is an argument for the physician's not prescribing the potent remedies except with great care. But the thing I wish to emphasize is, that the pharmacist should endeavor to persuade the physician not to prescribe tincture of aconite to be dispensed in drops.

MR. HYNSON: I think the Chairman is allowing discussion on a question that appertains more properly to the Section on Practical Pharmacy and Dispensing.

Mr. England was now called upon, and read a paper he had prepared on the milk-product industry in this country:

THE AMERICAN MILK PRODUCT INDUSTRY.

BY JOSEPH W. ENGLAND.

Within a very few years, relatively, there has arisen an industry in this country that seems potential with unusual possibilities—the manufacture of milk sugar, casein and other products derived from cow's milk. To-day, fully three-fourths of all the milk sugar produced in the world, and probably a larger proportion of casein, is made in the United States.

Accounts vary as to when sugar of milk was first used, some claiming that its discovery was coincidental with that of cheese, and others (National Dispensatory, 1894, 1898) that it was first prepared by Bertoletti in 1619, and used medicinally by Testi in 1698. The most authentic statements, however, assert that it was discovered about 175 years ago by a peasant in Switzerland during the manufacture of "Zeiger," a kind of cheese manufactured from whey, who noticed that after hanging the "Zeiger" in a bag to drain out the whey, a few crystals had been formed by the evaporation of that liquid. These he gathered up, washed and took to a pharmacist, who expressed the opinion that if the product could be manufactured in quantity, it would become an important article of commerce. From this very small beginning, the business of milk-sugar production has grown to its present large dimensions. Not only this, but other milk products have been developed, one of which, casein, is of greater importance to-day, in the technical world, than milk sugar.

Up to about twenty years ago, eight refiners in the small village of Marbach, in the County of Luzerne, Switzerland, produced more than 90 per cent. of all the sugar of milk consumed; which, however, was then rela-

tively small compared with the present output. The process originally used (Pharm. Journal and Trans., Nov. 11, 1876, *vide* American Journal of Pharmacy, 1877, 57), was simply evaporation (at the place of production) of the whey left after cheese making, to obtain the crude sugar, which was sent to the refiner, who washed it, dissolved it in water to saturation over a fire, strained and crystallized in copper-lined tubs or troughs, pieces of wood being immersed in the solution to facilitate crystallization. The crystallization took from ten to fourteen days. The crystals were then washed with cold water, dried, and packed. The entire operation was conducted in a very primitive manner, and it can be readily seen how such milk sugar contained, as it often did, micro-organisms and products arising from the decomposition of the animal constituents of milk, impurities which singularly enough are not excluded by the tests of the Pharmacopœias (Druggists' Circular, 1893, 350; Bull. Pharm., 1893, 5; Pharm. Journ. Trans., 1894, 853).

Later, the process was somewhat improved. The milk was coagulated with diluted sulphuric acid, and the resulting whey evaporated to a brown, viscid, sweetly-saline mass, and put into tubs, where in from one to two days, the sugar crystallized out in a bright-yellow granular mass ("Zuckersand" or "Sugar sand"), which was then decolorized by animal charcoal and repeated crystallizations (American Druggist, September, 1884).

About 1881 various attempts were made in the United States to manufacture milk sugar, but with very indifferent success. Dr. Gerber, a Swiss manufacturer, came to this country and established a factory at Little Falls, N. Y. After working for over two years, he gave up his attempt as a failure, and returned to Switzerland, declaring that on account of the poor quality of milk in the United States, the Swiss milk sugar producers need never fear any competition from this country. After this, many other attempts were made to produce the sugar, but they resulted in failures. About fifteen years ago, however, two different companies, one located at Burlington, Vermont, and the other at Unionville, N. J., succeeded in producing a fairly pure article.

The process was improved from time to time, until, at present, the quality of American-made milk sugar is the standard of excellence throughout the world. The Swiss producers have been forced by American competition and the failure of fuel in their own country, to give up the manufacture of milk sugar, though it is still produced in different parts of Germany and Italy. Out of the many thousands of pounds of milk sugar used in the United States to-day, the imports are exceedingly small, amounting during the fiscal year of 1900, to 2,378 pounds; and during the fiscal year of 1901, to 3,638 pounds. There are only three or four places in this country where milk sugar is made, and yet it is produced here in greater quantity than anywhere else in the world. The Bureau of Statistics keeps no record of the export of the American milk sugar, but

it is known to be quite large. Not only milk sugar, but casein as well, is being made in increasingly large quantities. During the census year of 1900, 12,298,405 pounds of casein were made in this country, the State of New York producing more than half the total quantity.

The industry of milk products has become possible only through the origin and development of creameries. These latter are large plants located in dairy districts, with centrifugal machines or separators (which first made their appearance in America in 1879), vats, washing and pressing devices, automatic drying machines, and grinders both for wet and dry products. To these creameries, there are brought by wagons and trains, thousands of gallons of milk daily, and this is worked up into the different milk products. The general procedure has been recently and excellently described by Charles H. LaWall (Alumni Report, April, 1902), as follows :

“ After an examination and determination of the fat of the milk, it is put into a mixing tank, warmed to 80 degrees F., and run into a separator. The latter are usually worked in pairs, and continuously during the day. The cream coming from the separator contains 41 per cent. of fat, and is immediately Pasteurized by an ingenious apparatus in the form of a spiral gutter that increases in diameter as it descends. The cream runs into the gutter at the top at a temperature of 80 degrees F., descends (being heated) and runs out at the bottom at a temperature of 160 degrees F., being stirred continuously during its passage. It is claimed that cream Pasteurized by this method is superior to that Pasteurized by the ‘close’ process (*i. e.*, heating in bulk in a closed vessel), the product of the latter containing the original odors of milk in an exaggerated form, becoming unpalatable, and spoiling more quickly. The hot cream is now run over a cooling coil to ordinary temperature and placed in cans for shipment. Before sending out this cream for use by the consumer, it must be diluted with water, as it is too rich for use, being in such a concentrated state that it becomes semi-solid if chilled to 50 or 60 degrees F. The cream from the second separator is usually used for butter-making. The skim-milk that flows from the lower part of the separator is conducted into tanks and heated by live steam to 120 degrees F. and coagulated by hydrochloric acid, being thoroughly stirred. After the subsidence of the casein into a uniform mass, the whey or residual liquid is used for the manufacture of milk sugar.”

The American method of manufacturing milk-sugar is radically different from that followed abroad, and is thus described by LaWall :

“ The whey left after the first curdling of the milk (by the separator system) is run into vats, and treated with about 1 per cent. of hydrochloric acid to remove remaining proteid matters, the liquid being heated to the boiling point, and exactly neutralized with calcium hydrate. The whey is then generally filtered through a filter press and evaporated in vacuo to a thick syrup, run into pans, and allowed to stand for two days, when granular crusts form. These are then centrifuged and washed with cold water to remove calcium chloride and soluble impurities, and the washings are reserved for future operations. The crude milk-sugar is of a very light yellow color, and has little taste or odor. It is redissolved in water and the solution filtered through bone-black in percolators. The water-white syrupy percolate is concentrated in vacuo to a pasty mass, which is placed in a centrifuge and washed with cold water. The mass is then dried on strainers in a drying chamber at 140 degrees F., powdered in a ball mill, and bolted.

“ The casein obtained by acidulation of the skim-milk and subsidence, is washed and

heated with water containing a small amount of sulphuric acid, to remove impurities. The moist pulpy mass left after the removal of the water is then shredded by means of cutting knives run by a high-speed engine; the flakes being removed in wire gauze frames and rapidly dried with a current of air at 140 degrees F. It is then powdered with high-speed disintegrators."

Casein was first made in a commercial way in this country about six years ago. Prior to that time, small quantities of variable quality were made by hand in Germany and Switzerland, but were sold at prices that inhibited general use.

It varies in characteristics according to the precipitant used in its production and the character of solvent employed in its use. The acids employed for precipitation are usually hydrochloric, sulphuric, acetic, lactic, or phosphoric. The solvents used are generally the alkaline salts, such as sodium bicarbonate, sodium baborate, sodium phosphate, calcium hydrate, ammonium hydrate, etc. One solvent will, for example, produce a solution of casein that will dry in and close the surface of a blotting paper, whereas the same casein dissolved in another solvent and with the same strength of solution, will penetrate an oak board.

One of the most striking features of casein is that its physical properties can be greatly modified by very slight changes in conditions and in a way to give a great variety of results. Thus it is now used in the preparation of substitutes for glue, gelatin, shellac, linseed oil, blood, and egg albumen, and also for many of the cheaper adhesive products. The ease with which it can be dissolved and then made insoluble after drying, is one of its most important properties. It dissolves in weak alkaline solutions, and in these it becomes insoluble in time, without requiring any subsequent treatment, and remains unchanged in composition, differing in this respect from nitrogenous materials generally. Wood joints made with it are remarkably permanent, even when subjected to great changes of temperature and atmospheric conditions, surpassing glue in this respect. Not only this, but the casein joint properly seasoned becomes insoluble in hot or cold water, or even in weak acids or alkalies.

Casein is used very largely to-day in the majority of paper enameling and glazing mills, both here and in Europe. In the paper coating mills an alkaline solution of casein is mixed with the pigment and a small quantity of formaldehyde, and applied to the paper. The mixture is quite soluble for two or three days, and then becomes insoluble. This insolubility results without regard to atmospheric conditions. This peculiar property makes casein particularly well adapted for pigment printing of cotton cloths, as it requires no subsequent steaming or other secondary process. With it light colored pigments can be printed without change of color, and the goods will stand very severe washing. It is used also for the sizing of yarns and the filling of yarns and textiles with finishing materials (being much superior to starch or glue), and in the first coating of oil-cloths.

Experiments have been made with the use of casein for the production of water-proof bags for the shipment of coffee, tea and other articles that are easily injured by the absorption of odors or moisture. The process seems to be especially well adapted for the lining of paper bags to hold damp articles, and also for the improving of the laps and joints which invariably separate when made with glue or paste. Experimentally, paper bags have been coated and the joints made with casein, and then filled with water, and these remained without leakage until the water had evaporated. Paper bags, however, are not puncture proof, and of course could not serve as containers for liquids; but the thought suggests itself to the writer that possibly they might find an important application as a container for those chemicals that are deliquescent or hygroscopic. Casein-lined bags would certainly be superior to paraffin paper, for the reason that no glue or paste will adhere to the latter, and no method has yet been found for making a satisfactory joint. If the use of casein-lined bags be practicable for the purpose referred*to, it would mean the saving of many dollars a year on glass and freight to chemical manufacturers.

Casein is used very largely to-day in place of glue in the making of water-proof veneers and enameled book paper, in the finishing of kid and leather as a substitute for blood and shellac, in the sizing of silk in the place of gelatin, as a wood filler and under body in wood for varnishing, and (with slacked lime as the alkaline solvent) in the manufacture of water paints, which are both water and weather proof, enormous quantities of which are now being sold.

In a "Receipt Book," written by John J. Edwards, 226 High Street, Philadelphia, under date of October 12, 1809, and shown at the Historical Exhibition of the A. Ph. A., there is given the following formula for a "cheap white paint," abstracted, it is stated, in 1809, from an English publication: "Take skim-milk, 2 quarts; fresh slacked lime, $\frac{1}{2}$ pound; linseed oil, 6 ounces; white Burgundy pitch, 2 ounces. The lime is to be slacked in water, exposed to air, and mixed with about one-fourth of the milk. The oil, in which the pitch has been previously dissolved, is to be added a little at a time, then the rest of the milk, and afterward Spanish White.* The quantity is said to be enough for 27 square yards of surface, two coats, and the expense is a mere trifle."

* Spanish White is stated by Schmidt (*Pharmaceutische Chemie*, 1898, 430), to be a mixture of bismuth subnitrate and bismuth subchloride, but it is not probable that expensive bismuth compounds were used in 1809, as addition to a "cheap paint." On the contrary, by Spanish White was evidently meant Spanish whiting. The writer is advised by Mr. Howard B. French, of Samuel N. French & Co., of Philadelphia, that Spanish White is a very old name in the paint trade for ordinary whiting, and this was at one time imported from Spain under the name of Spanish White. Further, William J. Jenks, of Philadelphia, recalls the fact that in 1838 Smith and Hodgson, of Sixth and Arch Streets, Philadelphia, imported a lot of Spanish White from England. This he describes as being a very finely washed whiting of high purity. While originally coming from

Thus it appears that practically a century ago the essential ingredients of the modern water-paint were used, although not, of course, in the present superior form.

In the manufacture of water and rust-proof paste for labels, casein is also used; it is also claimed that when used on labels and applied to bottles or tin, it will not permit the ready removal of the label. It would be interesting to make experiments to see if a casein paste could not be made that would be of special value to pharmaceutical workers.

Casein is somewhat adhesive, but not so much so as acacia. It makes a beautifully white creamy emulsion of cod-liver oil, according to the following formula: Dissolve 100 Gms. of soluble casein in some warm water to make a creamy paste, then emulsify with 325 Cc. of cod-liver oil, adding sufficient water to make 800 Cc.

The emulsion, however, is too thick, is apt to break, and decomposes in a few days. At the same time it may be possible to overcome these objections, and the subject is worthy of investigation.

Casein is used as a lining for oil barrels to prevent absorption. Possibly it might also be of value as a lining for barrels containing alcohol or alcoholic liquids. Experiments along this line are desirable.

The writer has dwelt at some length upon the subject of casein and its application in the technical world generally, because casein seems to be a raw material of unusual possibilities, and it is very probable that it may find important applications in the pharmaceutical world.

Mr. Kraemer moved to accept and refer for publication, and the motion prevailed.

Mr. Edward Kremers said that, as it was quite late in the evening, he would like to move that the session should adjourn now, and that the Chairman be instructed to call the Scientific Section together again promptly at 9 o'clock to-morrow (Thursday) morning. And the motion was so put and carried.

SECOND SESSION—THURSDAY MORNING SEPT. 11, 1902.

The second session of the Scientific Section was held in the convention hall of the Hotel Walton, and was called to order at 9:40 A. M., by Chairman Kebler.

THE CHAIRMAN: The first matter for consideration is the reading of the minutes of the first session by the Secretary, but in view of the fact that we have so much ground to get over this morning, it seems to me it would be well to dispense with the reading of the minutes, and the Chairman will entertain a motion to that effect.

Spain, it was all imported at the time mentioned from England. It is also of interest to note that for many years the Pennsylvania Germans have used as a paint for their barns, mixture of thickened milk and Venitian-red (crude ferric oxide).

MR. ENGLAND (Secretary): I would like to have one thing straightened out, and that is the disposition of the Chairman's address. As I have it on my minutes, the Chairman's address was received and accepted and referred to a special committee of three.

THE CHAIRMAN: Was that the disposition of the paper?

MR. SCHLOTTERBECK: I was under the impression it was finally referred to the Committee on Revision of the Pharmacopœia.

THE CHAIRMAN: Is it to be referred to a committee, that is to be appointed by our Associate, Mr. Schlotterbeck, who was in the chair at the time.

MR. LYONS: As the mover of the original motion, I would like to have it understood that it is to take that course.

THE CHAIRMAN: With that understanding, then, it will be disposed of in that manner, and Mr. Schlotterbeck will appoint the committee and announce it later. Now, having disposed of this matter in the minutes, it does not appear necessary to do anything further, and a motion to dispense with the remaining portion of the minutes will be in order.

Mr. Lyons so moved, and the motion prevailed.

THE CHAIRMAN: The next item of business is the election of officers for the ensuing year. Further nominations may be made at this session. The first office to be filled is that of Chairman of the Section. Two nominations have been made already, Mr. Joseph W. England and Mr. J. O. Schlotterbeck. Are there any further nominations for Chairman? If not, a motion to close the nominations will be in order.

Mr. Mason so moved, and it was so ordered.

THE CHAIRMAN: How shall your Chairman be elected, gentlemen, by ballot or how?

MR. STEVENS: Since one of the gentlemen named for Chairman is also in nomination for Secretary, it will be necessary to vote separately, I think.

The chair accordingly ruled that balloting for Chairman was now in order, and appointed Mr. Mittelbach and Mr. Lindly as tellers to take and count the vote.

The gentlemen named performed the duty assigned them, and on completion of the ballot and count of the vote Mr. Mittelbach announced that Mr. England had received 8 votes and Mr. Schlotterbeck 20.

THE CHAIRMAN: You have heard the result of the ballot, gentlemen, according to which Mr. England receives 8 votes and Mr. Schlotterbeck 20 votes. According to the rules, Mr. Schlotterbeck is elected Chairman of the Scientific Section for the ensuing year, and I so declare. [Applause.]

The chair then stated that the next order of business was the election of a Secretary, for which place Mr. England only was in nomination, and asked if there were any further nominations.

Mr. Stevens moved that nominations for Secretary be closed, and that the Chairman cast the affirmative ballot of the Section electing Mr. England to that office. The motion was seconded by Mr. Lyons and carried,

and the Chairman announced that he had cast the vote as directed, and declared Mr. England duly elected Secretary for the ensuing year.

THE CHAIRMAN: The next item of business is the report of committees. Under this head, we will listen to the report of the Committee on Research, by Mr. Lyons, chairman.

Mr. Lyons presented the report as follows :

REPORT OF RESEARCH COMMITTEE OF THE SECTION ON SCIENTIFIC PAPERS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

It is but a meagre report that the Chairman of the Research Committee can present this year. Like the year preceding, the past has not been a favorable one for research along original lines.

Many problems have arisen in connection with the work of the Pharmacopœial Revision Committee that have demanded a careful review of old researches in various directions. The result of this laborious but rather thankless work will be embodied in the Pharmacopœia of 1900, which is still in process of incubation.

The Chairman has not been able to get in full reports from the several members of the committee in relation to such original research work as has been in progress in their hands, but believes that there has been no lack of energy or enthusiasm on the part of any in prosecuting work already undertaken.

Under the direction of Dr. Dohme interesting researches have been conducted on the Pharmacology of Narcotine, on the Active Principle of Ergot, and on the Active Principle of Rhubarb. Some of the results of these it is hoped will be ready for presentation at the present meeting.

The work in charge of Dr. Rusby on the Mydriatic Alkaloids has been continued, a portion of it having taken form in a valuable paper by Prof. Cushney, of the University of Michigan, on the Comparative Action of Hyoscyamine and Atropine.

Dr. Kremers has continued his researches on volatile oils and has published monographs on several of the official oils. Papers will be presented at the present meeting on "Oil of Wintergreen and its Adulterants," and on "Oil of Cloves," revision of its Pharmacopœia test. In addition to this Dr. Kremers has made contributions also to our knowledge of Glycerophosphoric Acid and Glycerophosphates.

Under direction of the Chairman some work has been done in improving and rendering practical the fermentation test for sugar so as to make it quantitative, the results embodied in part in a paper printed in the Pharmaceutical Review. Investigation of a possible volatile alkaloid in *Hyoscyamus* has also been initiated by him. A good deal of work has been done on formulating reliable methods for the physiological assay of drugs, some of this work appearing in a paper to be presented at this meeting on the Relative Activity of Preparations of *Digitalis* and Kindred Drugs, as shown by Experiments on Frogs."

Respectfully submitted,

A. B. LYONS, *Chairman.*

Mr. Kremers moved that the report be accepted and referred for publication, and that the committee be dismissed, and the motion was seconded by Mr. Coblentz and carried.

THE CHAIRMAN: The chair is rather in doubt as to what has been done with the Committee on Adulterations. Is that committee to be continued, or simply dropped? What is to be done in this matter?

MR. LYONS: I think no action was taken in regard to that, but I move that the Committee on Adulterations be continued.

The motion was seconded by Mr. Mason and carried.

THE CHAIRMAN: If there are no other committees to report, we will turn our attention to incidental business. Is there any incidental business? There appears to be none, and we will therefore take up the reading of papers and discussion of the same, and we will begin where we left off last night. The first paper in regular order, then, is one on "Some Curious Oils," by Mr. Pancoast and myself. You have received copies of that paper in printed form, and in view of the fact that we have so little time we will not say anything about it, unless some one wishes especially to make some remarks. The paper contains the names of all kinds of curious oils, and shows how they are frequently filled. We took up "bat" oil, "brick" oil, "skunk" oil, "rattlesnake" oil and many others. Some of them were found to be authentic products. We have analyzed them and put the results in this paper.

Mr. Stevens moved that the paper take the usual course, which motion was seconded by Mr. Mason and carried.

The full text of the paper was as follows:

SOME CURIOUS OILS.

BY LYMAN F. KEBLER AND DR. GEO. R. PANCOAST.

In the drug trade demands come from time to time for curious oils, some of which are exceedingly interesting. When such calls come many druggists are very loath to see an inquiring customer depart without having his wants supplied, knowing full well that some one will comply with his request by giving him something, which, as a rule, is not true to name. Many of these oils can be supplied in some localities, but in others it is practically impossible to secure them. The use of the oils is chiefly prompted by their traditional value for rheumatism, and this in a measure explains why some orders are filled as indicated below.

For several years we have been collecting data from various sources, and below give our results to date:

Adder Oil.—This is generally filled by mixing lard oil three parts, skunk oil, 1 part.

Angle-worm Oil.—One formula reads as follows: "Linseed oil, 19 parts; animal oil, 1 part." Another formula for *Oleum Lumbricorum* directs that the angle-worm be smothered in wine, then digested in two parts of olive oil and expressed. According to another formula, angle-worms are sealed up in a bottle, the latter enclosed in bread dough, and then the whole baked in an oven. The decomposition fluid thus obtained from the worms is poured off. Hager's formula consists of rape seed oil, 25 parts, and oil of birch tar, 1 part.

According to another formula, one part of worms is cut up in one part of sherry wine, then infused in four parts of olive oil. Angle-worm oil is sometimes supplied by slightly coloring olive oil with oil of amber.

Ant Oil.—Oleum Formicarum. Digest four parts of ants in 16 parts of olive oil at a gentle heat and then strain.

Bait Oil or oil of rhodium, is used in trapping wild animals, for the purpose of disguising the odor of the person handling the traps, and usually consists of balsam copaiba 4 parts, salad oil 1 part, oil of almonds 5 parts, flavored with from 5 to 10 drops of oil of rose or rose geranium for each ounce of the mixture.

Bat Oil.—Some form of bird oil is usually supplied, such as chicken fat.

Bear's Oil.—This can be obtained in the United States ; coming usually from the black bear, but the cinnamon and grizzly bears often furnish some. Efforts should be made to secure a supply of the article during the bear-hunting season. The sample described below was obtained from a Philadelphia restaurant. The chef, for a consideration, saved the bear's fat for a season for one of us (P.). The article can, therefore, be reasonably considered genuine.

Bear's fat is a pale yellow, semi-opaque, oily liquid at summer heat, but solidifies in cold weather ; having a peculiar odor and a bland taste. At 15° C. it has a specific gravity of 0.913, an acid number equal to 3.93, a saponification number equal to 203.4, an iodine figure of 80.43 and congeals at plus 9° C.

Bear's fat is credited with the property of strengthening and invigorating the growth of hair. Unfortunately, the scarcity of the article has caused substitution to be resorted to in many cases, such as purified beef marrow, lard, veal fat and almond oil thickened with spermaciti. Barbers frequently use petrolatum and call it bear's grease.

Beaver Fat.—Neatsfoot oil is generally supplied.

Brick Oil.—As a rule this oil is not supplied by any one ; but is supposed to be made by the following formula : "Quench red-hot bricks in olive oil, break them into small fragments, distil in a retort with gradually increasing heat, and separate the oil from the distillate."

Calendula Oil, like oil of hyoscyamus, cantharides, etc., is usually sold as an infused oil. That is, the drug is macerated in some fixed oil, like olive oil, at a slightly elevated temperature for a given time and the oil expressed and filtered.

Clover Oil consists of an alcoholic solution of indefinite proportions of coumarin, vanillin, heliotropin.

Catfish Oil.—This oil can easily be secured in localities adjacent to the Mississippi river, where large catfish are caught ; but in other parts of the United States it is not so readily obtainable. Usually some fish oil is supplied.

Crocodile and Alligator Oils.—Fish oils are usually supplied.

Deer Oil.—This can usually be obtained from some of the restaurants where venison is served ; but in general, the oil is not readily obtained.

Dog Oil.—This is a common household remedy and may be found in

many farmers' homes ; but has not found its way into the trade channels to any extent.

Eel Oil is not readily procured, and usually some fish oil is supplied.

Fox Oil.—Skunk oil is frequently given ; but Dippel's oil, with a little tincture of asafetida, has also been supplied for this article.

Habacuc Oil.—For this the following mixture is usually put up : Chamomile oil, 1 part ; oil of thyme, oil of rue, oil of tansy, each 6 parts ; oil of wormwood (fatty), 200 parts.

Hedge Hog Oil.—Lard oil or neatsfoot oil, or mixtures of the two, are usually given.

Lobelia Oil.—A number of preparations are put up under this name. One is the true oil obtained from the lobelia seed by extraction with alcohol, and another is an alcoholic solution of the lobelia plant. Exactly how it is made we have been unable to ascertain.

Mullein Oil.—Several articles under this name are also found. One is an infused oil like calendula ; another is said to be made by collecting the flowers, placing them in a bottle which is tightly stoppered, and the whole submitted to the action of the sun ; and it is said that the oil in time oozes out of the flowers. This we are told is the true oil of mullein.

Mink Oil.—Skunk oil is the article generally supplied.

Mercury Oil.—It is said an oil by this name has been supplied by placing some blue ointment in olive oil and agitating same. This is hardly creditable.

Mermaid's Oil is usually made up by mixing equal parts of cocoanut oil and lard oil, flavoring the same with cod-liver oil.

Ozonated Oil is made by passing oxygen into an oil such as cocoa-nut, sunflower, cod liver, etc., until no more will dissolve, then exposing for some time to the direct rays of the sun. Used in phthisis.

Pickarel Oil.—Fish oil is usually supplied.

Porcupine Oil.—Orders are filled like those for Hedge Hog oil.

Porpoise Oil.—This is a regular article of commerce, and can be obtained at any well regulated oil dealing establishment.

Rabbit Oil.—It is not difficult to obtain this oil, inasmuch as rabbits are frequently very plentiful.

Rat Oil.—We have been unable to find what has been supplied when an order came for this product.

Raccoon Oil.—One of us (K) has frequently seen this oil in his boyhood days, and it should be readily obtainable in certain farming communities. Lard oil is frequently supplied when raccoon oil is called for.

Rhodium Oil.—See Bait Oil.

Rattle Snake Oil is obtained from the *Crotalus*, a reptile peculiar to America, and much dreaded for its deadly venom, although it seldom attacks man unless molested, and its rattle usually gives timely warning of danger. Genuine rattlesnake oil can be obtained from those who make

it a business to hunt the rattlers in mountains or marshy parts of the country where the hand of man has not yet devastated the forest or broken the soil for his crops. Twice a year the rattlers quit their haunts and spend from 10 days to a fortnight close by the water. The hunter calls this habit their "Spring and Fall swims." They indulge in this custom soon after appearing in the spring, and just before hibernating for the winter. In August the snakes are blind, and necessarily sluggish in their movements. At this time they do not warn the intruder, and are, therefore, more dangerous, inasmuch as they strike without the customary warning or rattle, which if once heard will never be forgotten. During the hot weather the snakes get very thin, and it does not pay to catch them at this time, as the quantity of fat to be obtained is very small. In general, the oil of two dozen snakes is equal to that produced by one skunk. The forest fires kill many of them, and in consequence of this and other factors, they are decreasing in numbers every year, and one or more hunters are bitten every year by these snakes: but curiously enough, they seldom die from the effects of the poison; nevertheless they seldom recover entirely from its effect. Taking all these facts into consideration, it is not surprising that the genuine oil brings good prices; \$2.00 an ounce being readily paid. The demand appears to be continually increasing, while the source of supply is becoming exhausted, and in a few years it will no doubt be unobtainable.

A quantity of this oil, which we have every reason for believing genuine gave on analysis the following results: Specific gravity at 15 degrees C. 0.9217; acid number 3.57; saponification number 210.9; iodine figure 105.58.

Skunk Oil is obtained from *Mephitis Varians*, one of the weasel family. They are about the size of a common cat, generally black or brownish-black, with white and black stripes along the back, and a white ring around the neck. The skunk is sometimes called a pole-cat, although this name properly belongs to its English cousin (*Putorius Foetidus*), also called Foul Martin or Fitch. To artists the hair of the Fitch or the Fitchet is well known as that of which their best brushes are made; the long hairs which grow through the lighter colored fur of the animal being used for this purpose. The American skunk, in common with the pole-cat, depends as a means of defense upon an exceedingly fetid fluid which is discharged with considerable force and some degree of accuracy when attacked, from secretory glands located near the root of the tail.

The properly prepared oil is yellowish in color, odorless, and of a bland taste, with occasionally a sediment of stearin at the bottom of the container. All the oils obtainable in commerce, however, have more or less of the odor peculiar to the animal.

A number of samples examined during the past two years, gave the following results:

Number.	Specific Gravity at 15 degrees C.	Acid Number.	Saponification Number.
1.....	0.9120	2.85	207.57
2.....	0.9176	2.54	206.3
3.....	0.9234	18.9	220.12
4.....	0.9218	8.8	199
5.....	0.9166	31.0	206

No. 5 of the above is known to be genuine inasmuch as it was taken by one of us (K) directly from the animal. The acid number is a little high, which is probably due to a slight decomposition of the animal at the time the fat was removed. No. 3 seems to be of questionable purity.

Stillingia Oil.—An alcoholic extract of the root is at present supplied for this product. The exact manner in which it is made, we are not familiar with.

Stork Oil.—Some bird oil is usually supplied.

Sturgeon Oil.—Fish oil is usually supplied; but we see no reason why this oil cannot be obtained from the caviar factories, if application be made for it there.

Swallow Oil.—Some bird oil is usually supplied.

Sweet Cicily Oil.—Anise oil usually fills the requirement.

Turtle (Green) oil is obtained from the *Chelonia Mydas* commonly found in the markets, weighing from 700 to 800 pounds, and from 6 to 7 feet in length. In the proper seasons, the oil can be obtained from those who use these turtles for the tables in large hotels. These people are generally aware of the commercial value of this article, and use every effort to prepare it pure.

Viper Oil.—Usually filled like adder oil.

The next paper called for was one on oil of sweet almonds, also the joint contribution of Mr. Pancoast and the Chairman. Mr. Pancoast presented it in brief abstract, the following being the complete text:

EXPRESSED OIL OF SWEET ALMONDS AND ITS SUBSTITUTES.

BY GEO. R. PANCOAST AND LYMAN F. KEBLER.

This oil, although one of the most useful in the drug trade, is fast becoming a commercial curiosity—being almost entirely supplanted by some substitute.

The oil expressed from sweet almonds is rarely met with, inasmuch as manufacturers, in order to meet competition, use the cheaper bitter kernels, which yield about 50 per cent. of fatty oil, then utilize the cake after appropriate treatment, for the manufacture of so-called bitter oil of almonds; the yield being about 8 ounces of essential oil for each 100 pounds of material used. It is claimed that no one can make oil from sweet almonds and sell at a profit at the present market prices.

The peach kernel (*Prunus Persica* Jess.) yields both expressed and

essential oils that may be regarded as the equivalent, for practical purposes, of the oils obtained from bitter almonds.

The apricot kernel (*Prunus Armeniaca* L.) is known in European commerce as "Peach Kernels." This article also yields both oils similar to the bitter almond oils; and is, we think, the chief material used to-day.

Notwithstanding some adverse criticisms that we have received for the stand we take in regard to the labelling of oils, we still think that the honest way is the best one. Let us buy and sell the almond oils as expressed and essential oils of bitter almonds, and expressed oil of sweet almonds; expressed and essential oils of apricot kernels and expressed and essential oils of peach kernels, all properly labeled. Although the three essential oils are practically identical, yet we think the wisest course to pursue is that of having but one name for an article, and that the right one.

The U. S. Pharm., 1890, gives the following description and tests of expressed oil of almond:

A clear, pale straw colored or colorless oily liquid, almost inodorous, and having a mild nutty taste (1).

Specific gravity at 15 degrees 0.915—0.920 (2).

Only slightly soluble in alcohol—soluble in ether and chloroform in all proportions (3).

Remains clear at —10 degrees C. and does not congeal until cooled to near —20 degrees C. (4)

If 2 Cc. of the oil be vigorously shaken with 1 Cc. of fuming nitric acid and 1 Cc. of water, a whitish (not red or brown) mixture should be formed, which after standing for some hours at about 10 degrees C. should separate into a solid white mass and a scarcely colored liquid (distinction from apricot, peach kernel, sesame, cotton-seed and poppy-seed oils (5)).

This test has replaced that given by Bieber (Analyst, 1884), who was the first to draw attention to the means of discriminating between almond oil and the so-called peach-kernel oil.

Later, Micko (Analyst, 1893) pointed out that the peach blossom color ascribed by Bieber to peach kernel oil, was really due to the presence of oil of apricot kernels.

Peach kernel and apricot kernel oils are substituted for almond oils, while cotton-seed, sesame, poppy, olive, and peanut oils are used as adulterants.

Messrs. Allen and Brewis in the Chemist and Druggist of July 28, 1900, give a report of 19 samples examined by them.

The following is a portion of their report:

	Specific Gravity.	Nitric Acid Test.	Separates.
7 samples of Expressed Oil of Bitter Almonds.	0.9177 to 0.9188	White, greenish-yellow, afterwards white.	Solid yellow oil, and colorless liquid.
2 Sweet Almonds.	0.9185 to 0.9191	White.	Same.
Peach Kernel.	0.9185	Pale pink, quickly changing.	Deep orange oil, colorless liquid.
6 samples Foreign Pressed Oils.	0.9221 to 0.9233	Brownish red.	Various brown shades.
3 other samples.	0.9180 to 0.9218	Deep salmon color.	Deep orange oil, colorless liquid.

Dr. H. Hager states that oils expressed from large sweet almonds and the smaller bitter almonds differ considerably, as shown by the Elaidin test: the former oil congealing more rapidly and almost completely, the latter oil about 12 hours later and more imperfectly when smaller bitter almonds are used. Only about one-third of the bulk congeals when the small Oporto almonds are used.

Hager applied the test as follows: Shake 1 Cc. fuming nitric acid with 2 Cc. almond oil vigorously. A whitish mixture must be formed, which separates when set aside for some time at about 10° C. (50° F.) into a solid white mass and a scarcely colored liquid. Peach and apricot kernels give a red, and sesame and cotton-seed a brown coloration.

The Sodium Hydrate Test (7): Mix 10 Cc. almond oil, 15 Cc. of a 15 per cent. sodium hydrate solution, and 10 Cc. alcohol; heat to 35° or 40° C. (95°–104° F.), stirring occasionally, until the mixture has become clear. From the clear solution obtained after the addition of 100 Cc. water and acidulation with hydrochloric acid, a layer of oleic acid separates, which when collected, washed with warm water and clarified on the water-bath, remains liquid at 15° C. (59° F.) One part of oleic acid must give a clear solution with one volume of alcohol, from which, at 15° C. (59° F.), fatty acids do not separate, and which should not be rendered turbid by the addition of another volume of alcohol. Should it become solid or semi-solid, it indicates adulteration with olive, peanut, cotton-seed, poppy-seed or other oils; but not with apricot kernel oil.

The Iodine Absorption Test (8):

In the 4th edition of the German Pharmacopœia the following test has

been added : 100 parts of almond oil should absorb not less than 95 parts, and not more than 100 parts of iodine.

The absorption number of oil of peach kernels was found to be 99 ; rape seed oil, 100 ; olive oil, 81 to 84 ; linseed oil, 170 to 180.

A mixture of 3 parts almond oil and 1 part olive oil gave 93.

A mixture of 1 part almond oil and 1 part olive oil gave 89.

Mr. J. C. Umney (P. J., July, 1899, and Jan., 1900) considers the test with fuming nitric acid to be incapable of detecting the presence of peach kernel oil, but useful for detecting apricot oil.

According to Hirsch the name Pfirsich-kerne (the only equivalent for which, in English, is peach kernel) should not be taken to mean the kernels of the common peach (*Prunus Persica* or *Amygdala Persica*), but a small sort of the bitter almond—a variety of the *Amygdala Communis*. This oil undoubtedly affords the reaction described in the Pharmacopœia.

Hager's test (9) :

Agitate the oil with equal volume of 25 per cent. nitric acid ; warm to 60° C. (140° F.) It will remain white or faintly yellowish if pure, but will become deeper yellow in proportion to the amount of peach or apricot kernel oil present.

These oils become at once yellow, and gradually orange yellow.

J. D. Bieber's test. 1877—Am. Jour. Pharm. (10) :

Mix 5 volumes of oil with 1 volume of a cold mixture of equal weights of sulphuric acid, fuming nitric acid and water.

Almond oil becomes yellowish white.

Peach kernel oil becomes red to orange.

Sesame oil becomes pale yellowish red, then dirty orange.

Poppy oil }
Walnut kernel oil } become somewhat whiter than almond oil.

The authors employed this test upon samples of English so-called *sweet* almond oil, and a sweet almond oil of their own manufacture, besides other oils.

English so-called sweet almond oil—Milky turbidity ; afterwards cream white.

True sweet almond oil—White, afterwards yellowish.

Peach kernel oil—Yellowish red ; after 36 hours peach blossom color.

Sesame oil—Lemon yellow ; after 36 hours no change.

Walnut kernel oil—Yellow turbid ; after 36 hours no change.

Poppy oil—Yellow turbid ; after 36 hours lighter color than walnut kernel oil.

Nitric Acid (sp. gr. 1.40) test (11) :

Almond oil—Pale yellow liquid.

Peach kernel oil—Red.

Sesame oil—Yellowish green ; afterwards red.

Poppy oil }
Walnut oil } White.

Liponitz' (1868) test for admixture of drying with non-drying oils (12). Triturate 8 parts oil with 1 part chlorinated lime. In a few hours the mixture, if made with non-drying oils, will separate a layer of limpid oil, while none will separate from a drying oil.

Fuming nitric acid and water test (13) :

Agitate 15 parts of oil with a mixture of three parts of fuming nitric acid and 2 parts of water.

Sweet almond oil—White turbidity.

Expressed oil of bitter almonds—Forms a rather soft mass.

Cotton-seed, peanut, sesame, etc.—Brown or red.

The authors tried this test with the result that the English so-called sweet almond oil showed the reaction given for the expressed oil of bitter almonds, while the true sweet almond oil responded to the test given for it. After standing 48 hours the sweet almond oil showed a clear yellow color with slight film at bottom—above a clear acid layer—while the bitter almond oil remained turbid.

Almond oil at a temperature of 5° C. (41° F.) should not produce a white granular deposit—absence of olive oil, lard oil, etc. (14).

Behren's test (1852)—Equal parts nitric and sulphuric acids added to equal weight of oil (15).

Sesame—Brownish green zone. When shaken thoroughly, green color appears. Violent reaction takes place with great heat. Contents of vial or test tube ejected with some force and with some danger to the investigator.

Poppy oil—Red color becoming black ; then the same violent reaction as with sesame oil.

Lucca cream olive oil—Yellow color becoming green, then brown, and finally brownish red.

Malaga olive oil—Same as Lucca cream, but with darker tints.

According to Henry Nelis (*Annals de Pharmacie de Louvain*), true oil of sweet almonds should have the following characteristics : Very fluid ; of a clear yellow color ; sweet and pleasant taste ; soluble in ether ; almost insoluble in alcohol, even absolute, 100 Gm. of the latter dissolving only 62 Gm. of the oil ; it thickens at 10° C. (50° F.) and becomes solid at 16° C. (60.8° F.) Its density at 15° C. (59° F.) varies between 0.9177 and 0.9181. Refractive index plus 8 degrees. With sulphuric acid, it heats to 53° C. (127.4° F.) Point of fusion of its fatty acids is 14° C. (57.2° F.) (A) When equal quantities of almond oil and nitric acid are mixed, there appears at once between the liquids a zone of clear green, followed by a violent reaction. (B) A mixture of nitric acid and sulphuric acid with the pure oil gives the latter an orange-yellow color. (C) Bichloride of tin yields no color reaction. (D) Syrupy phosphoric acid completely decolorizes the true oil. (E) Agitated with lead acetate, it takes on a white turbidity.

The authors tried these tests with the following results :

	A	B	C	D	E
	Nitric Acid.	Nitric and Sulphuric Acids.	Tin Chloride.	Phosphoric.	Lead Acetate.
Nelis Results.	Clear green zone followed by violent reaction.	Orange-yellow color.	No change.	Completely decolorized.	White turbidity.
English so-called Sweet Almonds.	No color. No reaction.	No change.	No change, after 2 days white turbidity.	Same.	No change, after 2 days white turbidity.
True Sweet Almonds.	Same.	No change, after 2 days a thin orange-yellow film.	No change.	Same.	No change.
Peach Kernel.	Slight zone of discoloration.	Red film.	Same.	Whitish.	Slight turbidity after 24 hours.
Sesame.	Orange zone becomes darker.	Dirty orange.	Decolorized white turbid.	Decolorized.	Decolorized white turbid.
Cotton-seed. Olive flavor.	After 24 hours orange zone.	Orange-yellow.	Slight reaction.	Same.	No change.
Cotton-seed. Winter White.	Same.	Brown color, then deep orange.	Same.	Thick brown turbid.	Upper liquid thickened. Lower liquid turbid.
Lucca Cream. Olive Oil.	Yellowish-green turbid.	Brownish-yellow.	Yellow.	Turbid yellow.	Solid yellowish-white.
Malaga Olive Oil.	Same.	Yellowish-white turbidity.	Yellow turbid.	Yellowish-white.	Same.

Acetic anhydride test (17) : Equal parts of oil and acetic anhydride agitated vigorously together, yielded the following results :

True oil of sweet almonds settles in 2 minutes, in 2 layers—a clear upper oil, and the other slightly turbid acid.

English so-called sweet almond oil settles more slowly with the same results, with a slight film between the two layers.

1 part acetic anhydride and 5 parts oil gave the following results :

	After 24 hrs.
No. 1. True sweet almond oil..	White turbidity.....Cream white.
" 2. English oil	No reaction.....Whitish.
" 3. Peach kernel oil	Whiter than No. 1 .....Same as No. 1.
" 4. Sesame	Clear.
" 5. Cotton-seed W.W.....	Clear.
" 6. Cotton seed O.F.	Yellow turbid gradually becoming lighter.
" 7. Malaga olive oil	Same as No. 6.
" 8. Lucca cream olive oil ..	Lighter than No. 7.

Glacial acetic acid test (18) : 1 part to 2 oil.

True sweet almond oil cloudy ; after 5 minutes, 2 layers form—one of oil, one of acid : no reaction : no color.

English oil—Same after 5 minutes. Settles more slowly from a mass of

loosely emulsionized material to two layers. A slight turbid oil and the acid ; no color ; no reaction.

Ammonia water (20°) test (19) : 1 part to 5 oil.

After 24 hours.

- No. 1. Sweet almond oil White emulsion Same.
 " 2. English oilWhiter than No. 1Partly separates.
 " 3. Poppy oilWhiter than No. 2Unchanged.
 " 4. SesameWhiter than No. 2 "
 " 5. Cotton-seed W.W.Whiter than No. 3 "
 " 6. Cotton-seed O.F. Yellow "
 " 7. Malaga oliveYellowish curd "
 " 8. Lucca cream olive ...Cream white emulsion. "
 " 9. Walnut kernelWhite curdSeparates somewhat.
 " 10. Peach kernelLike No. 2Unchanged.

Lead subacetate solution (20) : 1 part to 2 parts oil yield with almond oil a nearly white emulsion-like mixture, while other oils are more or less yellow.

After 36 hours.

- No. 1. Sweet almond Nearly white Yellow.
 " 2. English oil Nearly white Yellow turbid.
 " 3. PoppyWhiter than No. 1 Yellow.
 " 4. Cotton-seed W.W.Whiter than No. 1 "
 " 5. Cotton-seed O.F. Yellow "
 " 6. Sesame Cream white "
 " 7. Olive Malaga Greenish yellow Cream white.
 " 8. Olive Lucca cream Yellow Yellow.
 " 9. Peach kernel Same as No. 6 "

Bach's test (1883) (21) :

Agitate for one minute 5 Cc. oil and nitric acid ; afterwards place in boiling water for 5 minutes, and finally set aside for 18 hours at about 15° C. (59° F.)

	Cold.	Hot.	Finally.
Olive oil	Pale green	Orange-yellow ...	Solid.
Cotton-seed ..	Yellowish-brown .	Reddish-brown...	Butter-like consistence.
Sesame ...	White	Brownish-yellow ..	Liquid.
Peanut	Pale rose color...	Brownish-yellow ..	Solid.

Poppy seed oil tests (22) :

Sulphuric acid—Lemon yellow color, rapidly darker after 10 to 15 minutes, rose color becoming violet. If oil is turbid color reaction takes place in zone at surface of acid, rose color becoming dark red, finally violet.

Nitric acid—Dark orange yellow.

Nitrous acid—Darker in shade than nitric acid test.

Sesame oil tests (23) :

5 Cc. of oil shaken with equal volume of hydrochloric acid : the acid

will assume a bright emerald green color, especially on exposure. Add $7\frac{1}{2}$ grains of sugar, shake again, blue color changing to violet and finally to deep crimson will be produced.

In a half hour the bright emerald green zone was developed, then sugar was added. The acid layer in 10 minutes assumed a rose color; in a half hour, ruby red; in 2 hours, dark wine, then brown.

Sulphuric acid—Red, then brownish gelatinous mass.

Nitric acid—Orange yellow.

Nitrous acid—Darker yellow, gradually forms a semi-solid mass.

Peanut oil tests (24)—Kernels contain about 45 per cent. of oil.

Sulphuric acid—Grayish yellow, then greenish brown.

Nitric acid—Reddish.

Nitrous acid—Whitish mass.

S. P. Sadtler obtained the following constants for this oil:

		Virginia Oil.
Specific gravity.....	0.911 to 0.920	0.917
Saponification number.....	190.68 to 194.	192.53
Iodine value	85.6 to 98.4	91.75
Hehner value	94.87 to 95.86	94.87
Reichert-Meissel value.....	.484 to 1.60	0.484
Percentage of free acid as oleic acid ...	.546 to 6.20	0.546
Cold test of the oil	+2° to +10° C.	+3° C.
Mauzene test	45° to 56.75° C.	50.75° C.
Melting point of fatty acids	28° to 34° C.	29° C.
Solidifying point of fatty acids.....	25° to 32.5° C.	27.5° C.

Colza oil—M. Schneider's test (25):

Dissolve the oil in twice its volume of ether; add about 30 drops of a concentrated alcoholic solution of silver nitrate; shake the mixture, and allow it to stand in the dark. If there be much colza oil, the lower part of the liquid will become first brown and then black. If but little, the brown color will not appear for 12 hours; but the discoloration will always be apparent upon the evaporation of the ether.

Apricot kernel oil (26).

M. J. Nichols' test:

Powdered calcium hydrate forms an emulsion that slowly assumes an unctuous consistence: while it does not have such action upon almond oil, merely rendering it opaque for a time and then gradually separating and leaving the oil clear. A mixture of the two oils emulsionizes with the lime; but on standing, deposits the unctuous material referred to.

Dr. K. Dietrich gives the following complete analysis of samples of apricot kernel oil with a view to assisting in the detection of small quantities of this oil in genuine almond oil. The figures given apply both to the oil and the fatty acids.

	Oil.		Fatty Acids.
Specific gravity.....	.915 to	.924	.9095
Solidifying point	14° to	20°	0°
Melting point.....			4.5°
Refractometer number at 25° C..	65 to	67	56
Acid number	3.5 to	3.6	.....
Saponification number.....	193. to	215.	.....
Iodine number.....	100. to	109.	99. to 100.

The National Dispensatory gives the following test :

Sulphuric acid—8 or 10 drops of oil placed on a china plate : add 2 or 3 drops of sulphuric acid ; after a few minutes, stir.

Almonds, yellow, changing to pale brownish yellow.

Olive oil, yellow, turning brownish.

Cotton-seed, yellow, turning brown.

Peanut, yellow, turning green-brown.

Sesame, brown-red, becoming gelatinous.

Poppy, yellow to brownish green.

In conclusion, the authors would state that it is their belief that but a small amount of oil is expressed from sweet almonds, nearly all of the sweet kernels in the market being used by the confectioners.

Oil expressed from the bitter almonds, but labeled oil of sweet almonds, can be obtained in the markets.

For every pound of this article imported, at least 100 pounds of peach kernel or apricot kernel oils are also imported. We hope that in the future these oils will be properly labeled.

The oil of sweet almonds of our manufacture had a specific gravity of 0.9185 ; acid number, 0.5 ; saponification number, 197.5.

Mr. Lyons moved to receive the paper and refer for publication, and the motion prevailed.

The Chairman said Mr. Schlotterbeck would like now to announce the Committee on Chairman's Address, and he named the following : Virgil Coblentz, James M. Good and A. B. Lyons.

THE CHAIRMAN : We will now listen to Mr. Mittelbach on the subject of Creosote, as he has an engagement and is compelled to leave the room in a little while.

Mr. Mittelbach read the following, receiving the applause of his audience :

THE CREOSOTE QUESTION.

BY WM. MITTELBACH, BOONVILLE, MO.

A review of the creosote question exhibits the fact that but little advance has been made towards adjustment. It did seem that after the steps taken by the American Pharmaceutical Association last year, and followed closely by Merck & Co. in obtaining the hearty co-operation of manufacturer and jobber, that order would come out of chaos, and the word creosote would

soon mean but the one thing. It was hoped that our manufacturers, jobbers and pharmaceutical journals would drop the coal-tar creosote from their price lists. Such action would have helped very much, and in a few years the buyer of drugs and chemicals would know nothing about such a product. Of all the price lists passing through my hands since Jan. 1st, 1902, I find but two firms that, in my opinion, have taken the right course; these are Merck & Co., and Boehringer & Söhne, both foreign. All American lists quote the coal-tar creosote just as conspicuously as before. One has it commercial creosote, another quotes it German creosote, and still another the white from coal tar. So long as this condition exists, there will be very little hope that the question will be settled. The great difference in price will always attract the unscrupulous buyer. The American Pharmaceutical Association has taken the proper stand in the matter; Merck & Co. have the moral courage to stand by this decree; and there is no valid reason why all should not pursue the same course.

It is up to us to do the right thing. Our pharmaceutical journals have the power to give the matter a lift in the right direction. Will they do it? Or is all this noise about creosote hot air? The word creosote used in connection with any other product except that from beechwood, should be made a violation of law, just as much as the word listerine when used by substitutors. I asked a salesman if he had any demand for coal-tar creosote. He informed me that he had not under that name, but does have under the prices quoted. Many pharmacists and physicians will take up the price lists and buy the cheaper products, regardless of their derivation. They seem to care nothing for quality. This same salesman related an instance where he sold a physician-druggist a pound of creosote, and rightly delivered the beech-wood product. Upon his return the physician informed him that he did not intend to pay \$1.10 for it when he can buy any amount at 40 to 50 cents per pound. He cared nothing for the difference in medicinal properties; had used this other for thirty years; and would have been offended had the salesman tried to explain the matter. As a good salesman, however, he wisely kept his counsel, and made the exchange for the doctor. Such instances may bring a smile upon the faces of college men and scientists, but they are facts nevertheless, and the jobber and retail pharmacist bumps up against them every day, and principally for the reason that the article is so conspicuously quoted. If coal-tar creosote must be manufactured, let it be done quietly, and without flourish of trumpet. Don't tempt the unscrupulous dealer or consumer by low prices. Let all cease to quote the article, and watch the result. It is the price that keeps it in use, and not the merit of the article.

THE CHAIRMAN: The creosote question is a very interesting one, and Mr. Mittelbach's paper is certainly timely.

MR. LYONS: The importance of this subject will warrant us taking a kind of action

which I think we may be able to take on several questions of this sort. We have a very good representative to-day in the American Medical Association. Mr. Hallberg is Secretary of the Section on Materia Medica and Pharmacy in the American Medical Association, and I wish to move that, through this gentleman, we express to that Section of that Association our strong protest against the offering as creosote of the preparation in question which is offered as creosote—this coal-tar preparation—with such explanatory remarks as Mr. Hallberg may be able to make. I want the American Medical Association to understand that we make a strong protest against the sale as creosote of this coal-tar product.

Mr. Lloyd seconded the motion.

MR. BARTLEY: It seems to me this does not exactly correspond with the views expressed in the paper. We should try if possible, I think, to use our influence to correct the lists of the wholesale druggists, who quote prices on these articles. If a very sharp distinction could be made between the genuine creosote and the coal-tar and impure carbolic-acid products made by some, that would come more directly in the line of correcting the difficulty. The physician generally writes for creosote, and expects the beechwood creosote, and if this matter could be corrected so that the word "creosote" would always mean the beechwood creosote, and nothing else, this would obviate the difficulty. I think this motion is perhaps all right, if we could couple with it that the recommendation should be sent also to the Wholesale Druggists' Association. I suppose we will have a representative there, and if not, there are ways of reaching that organization. If we presented this resolution there, it would probably do more good than sending it to the American Medical Association, and I move that it also be sent to the Wholesale Druggists' Association.

Mr. Good seconded the motion.

MR. VAUGHAN: It occurs to me that the paper which has been presented has not been received by the Association yet. The Association should receive it first, and then we can discuss it. I move that the paper be received and referred to the Publication Committee.

THE CHAIRMAN: There is an amendment and a motion before the house. We will vote on the amendment first.

MR. COBLENTZ: I believe there is a pure food and drug law pending before Congress, and while we are sending resolutions to the American Medical Association we might send them to the committee having this bill in charge, also, and possibly accomplish some good in that direction, too.

MR. GOOD: Mr. Vaughan's motion should take precedence of anything else, and then we can take up the motions for reference of the resolutions.

MR. LYONS: I withdraw my motion until the paper is passed on.

MR. BARTLEY: The same as to my amendment.

MR. VAUGHAN: My motion is, that the paper be received by the Association and referred to the Publication Committee.

Mr. Lyons seconded the motion, and it prevailed.

MR. LYONS: Now I renew my motion, and I wish to say that I do not desire to have it amended. We can pass two motions if we wish. We have already appealed to the wholesale druggists by a resolution, but it has not had much effect. Now I wish to

make a different appeal, to the physicians of the country through the American Medical Association, and I hope the motion will carry. A different resolution to follow that might be in order.

THE CHAIRMAN: Both the original motion and amendment having been withdrawn, we will now act on Mr. Lyons' motion as last made.

And the question was so put and carried.

MR. BARTLEY: Now I move that we appeal to the wholesale druggists again, even if we have already done so, and call their attention to the facts about this creosote business by a separate motion. I move that the resolution just passed to refer to the American Medical Association be also referred to the wholesale druggists, and wherever else it will do the most good.

Mr. Hallberg seconded the motion.

MR. VAUGHAN: I would like to add the name of the manufacturer to that. The manufacturer makes the creosote, while the wholesale druggist merely sells it after it is made. I think the manufacturer is the proper man to strike at. The manufacturers furnish lists on which these things appear, and I think we should address them on the subject too.

MR. MITTELBACH: My intention was, to draw the attention of the publishers of these lists to this evil. It may be the manufacturer, the wholesaler or the editor of the drug journal. I am satisfied it is an oversight or neglect, and that they will gladly adopt our idea in this matter if their attention is called to it. If some designated officer of this Section or the Association were charged with the duty of appealing individually to the editor, manufacturer or wholesale druggist issuing such lists, showing them that it is the wish of this Association that this practice should cease, and that these things should be dropped from their lists, I believe in twelve months' time we could make them almost disappear from their lists. If some officer will do this, in addition to sending out these resolutions, I believe it would do good.

MR. HALLBERG: It seems to me the Committee of Revision of the Pharmacopœia could do more in this way than anybody else. I maintain the term "creosote" should be applied only to the distillate from wood, and that no one has any right to use it for a distillate of coal. I think the Pharmacopœia Committee, in the definition of creosote, might add a note to the effect that no other substance than that defined under the title "Creosote" should be sold as creosote; and then with that authoritative statement we can begin operations on the wholesale druggists' price-lists. Without a club like that you can do nothing with them. There are but one or two price-lists in this country, that I know of, that have only two gums; all the others have fifty-five gums, beginning with gum aloes and running down the line to gum shellac. They are the fellows that defeat the purpose of materia medica. It is useless to try to correct this unless we go after them with a club, and I move that this question be also referred to the Committee on Revision of the Pharmacopœia.

MR. BARTLEY: That is in the last clause of my motion—wherever else it will do the most good.

MR. HALLBERG: All right, then, if that is the understanding.

The chair then put the motion of Mr. Bartley and it carried.

The chair then called for the reading in abstract of two papers by Mr. Kremers, one on oil of wintergreen and the other on oil of cloves.

Mr. Kremers took up the first paper and presented his subject in abstract, the text of the paper being as follows :

OIL OF WINTERGREEN AND ITS ADULTERANTS.

BY EDWARD KREMERS.

Oil of sweet birch. According to Kennedy* and others who have studied the wintergreen oil industry in the districts of its production, wintergreen and birch are distilled together. This is done, no doubt, to impart to the birch oil the specific flavor of the wintergreen oil. No matter how slight quantitatively the chemical difference between the two oils may be, this practice seems to demonstrate that, originally at least, deception may have been intended.

The detection of the addition of sweet birch oil to true wintergreen oil seems to be impossible with our present knowledge of the chemical composition of the oils.

Synthetic methyl salicylate. There seems to exist little or no doubt in the minds of many that both true wintergreen oil and oil of sweet birch are extensively adulterated with synthetic methyl salicylate. Although the suspicion may be well founded, there exist equally good reasons why positive records of such cases are exceedingly scarce. There is no means of ascertaining whether *pure* methyl salicylate is natural or artificial. The presence of artificial ester *may* be detected if it contains impurities that lend themselves to detection by analytical methods.

The sources of impurity of artificial methyl salicylate are, for practical purposes, two-fold: (a) those introduced through the methyl or wood alcohol used; and (b) those coming from the salicylic acid. Artificial methyl salicylate, in order to make an effective adulterant from a commercial point of view, must be considerably cheaper than oil of sweet birch, which is the case.† If the artificial methyl salicylate is absolutely pure, the objections to its use as adulterant may become a problem of theoretical ethics pure and simple.

A. TESTS FOR IMPURITIES INTRODUCED THROUGH METHYL ALCOHOL.

(a) *Methyl ether.* Inasmuch as sulphuric acid ‡ was formerly used extensively if not almost exclusively as condensation agent in the manufac-

* Proc. A. Ph. A., 31, p. 399; also Am. Journ. Ph., 54, p. 49.

† Comparison of prices:—

Dodge & Olcott, July, 1902.		Fritzsche Bros., July, 1902.	
Oil Wintergreen, D. & O.	\$1.60	Wintergreen leaves	\$2.25
" " Artificial, Superlative . . . . .	.60	" natural (Oil of Sweet Birch) . . .	1.45
" " " D. & O. . . . .	.55	" synthetic . . . . .	.50

The prices in all cases given are on 25 lb. lots.

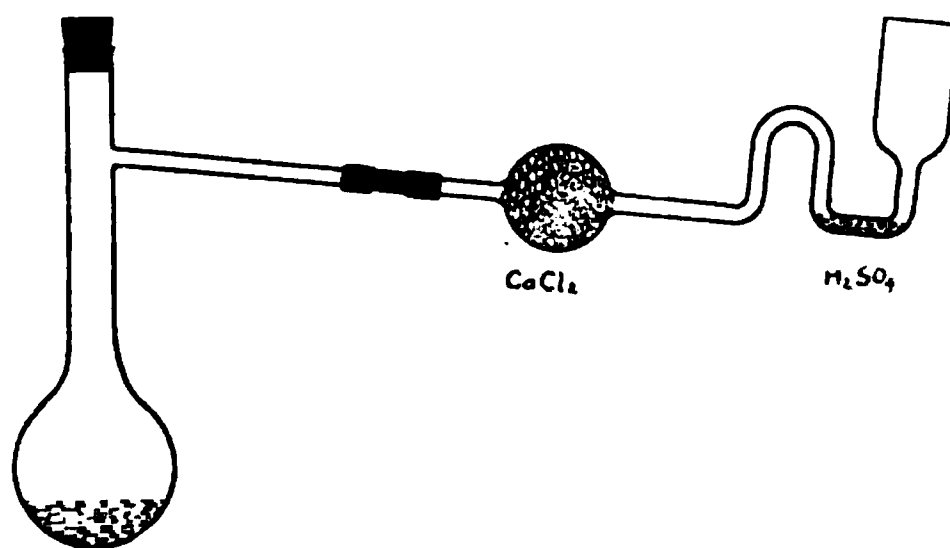
‡ "As condensation agents acid sulphates and aromatic sulphonic acids, e. g., benzene sulphononic acid, are occasionally used. These agents possess certain technical advantages over sulphuric acid."—Dr. C. K.

ure of methyl salicylate, it was but natural that methyl ether should have been formed in the course of the process of manufacture.

In 1887, C. Bullock* stated that artificial oil "may be distinguished from the natural oil by agitating a few drops with water in a tube; a tinted mixture is formed from which the oil does not separate for some time; the oil from the plant when agitated with water separates almost immediately in clear drops. The artificial oil contains a small amount of what appears to be a methyl ether which tends to suspend the oil in water; repeated washing removes most of this product, after which the oil settles more quickly."

F. B. Power,† in 1892, questions the presence of methyl ether, for, as he states, "methyl ether is a colorless gas which only condenses at -21° ."

In a private communication, C. Kleber in 1898 informed the writer that synthetic methyl salicylate "almost always contains some methyl ether." He suggested the following method for its detection: "The suspected oil



is poured into a fractionating flask, the tube of which is connected with a bulb-s-tube as indicated in the accompanying sketch. The bulb is charged with calcium chloride and the s-tube is sealed with a drop of concentrated sulphuric acid. The oil is heated until the vapors almost reach the exit tube of the distilling flask. The calcium chloride retains the moisture which is always present,‡ the sulphuric acid the methyl ether. By means of a capillary tube a drop of water is added to the sulphuric acid. If methyl ether is present it will be liberated at the surface of contact in the form of small bubbles."

In his more recent communication, Dr. Kleber is of the opinion that methyl ether has nothing to do with Bullock's test, for this ether is much more readily soluble in methyl salicylate than in water. He is of the opinion that any turbidity resulting in the test may be due to traces of methyl alcohol which are not infrequently found in the artificial oil.

* Am. Journ. Ph., 59, p. 8.

† Pharm. Rev., 10, p. 7.

‡ Whether ester rectified under diminished pressure contains even traces of moisture is possibly disputed. Such an ester would in all probability be free from methyl ether.

Concerning his methyl ether test, he emphasizes that it is of value only if the manufacturer has not taken the trouble to remove it, the removal being readily accomplished.

(b) *Condensation products of Acetone.* If impure methyl alcohol, containing acetone, has been used, the ester may contain condensation products of this ketone resulting from the action of the sulphuric acid on the ketone.* In a private communication (1898) C. Kleber suggests the following method which he had used extensively: To 2 Cm. of a 5 p. c. potassa (not soda) solution 5–6 drops of the oil are added and the mixture shaken. Synthetic oil should form a clear, odorless solution, but frequently the odor of condensation products becomes perceptible.

He is now of the opinion that a moderate acetone content does not necessarily render a commercial methyl alcohol unfit for the preparation of artificial wintergreen oil. Pure methyl alcohol, to which pure acetone had been added, yielded a crude ester which could be purified satisfactorily by means of washing and rectification. The most objectionable constituent of impure wood alcohol seems to be dimethyl acetal, q. v.

(c) *Methyl Alcohol.* In the process of esterification some methyl alcohol may go over unchanged, and if not removed in the process of rectification, may find its way into the finished article. It is evidently on this assumption that Dodge and Olcott † in 1891 stated that artificial methyl salicylate could be detected in natural oil of wintergreen or birch by means of aniline red. Concerning the earlier use of the fuchsine (aniline red) test for alcohol in volatile oils in general and the adulteration of natural sweet birch oil with alcohol, see "Alcohol."

Schimmel & Co., ‡ in the same year, point out the fact that fuchsine is soluble in methyl salicylate and that the non-ester constituents of true wintergreen oil (regarded as terpene at that time) interfered somewhat with the solubility of the dye-stuff, but not sufficiently to enable a distinction between the true wintergreen oil and synthetic methyl salicylate.

In the following year (1892) F. B. Power § tried the test and also found it insufficient and unreliable. Although the color imparted to true wintergreen oil was somewhat different from that imparted to oil of sweet birch and artificial methyl salicylate, no difference was noticeable in the color imparted to the last two by the dyestuff.

(d) *Condensation products of dimethyl acetal.* In his recent communication, Dr. Kleber points out that it is the dimethyl acetal which, on

* Three well-known condensation products of acetone, resulting from the dehydrating action of sulphuric acid, are mesitylene, mesityl oxide and phorone. Of these the second is reported to have a strong peppermint odor.

† Pharm. Rev., 11, p. 287; West. Druggist, 13, p. 264; Ph. Era, 6, p. 14.

‡ Bericht S. & Co., Oct., '91, p. 37.

§ Ph. Rev., 10, p. 7.

account of its indifference to reagents, is difficult to remove and, therefore, contained in all crude wood alcohols, is the most objectionable component. Submitted to the action of sulphuric acid it, either by itself or with acetone, produces condensation products of a very disagreeable odor.

If e. g. common wood alcohol, even the better commercial grades, is mixed without cooling with about an equal volume of concentrated sulphuric acid, the mixture commonly turns dark brown. If this be poured into water after a short time, a turbid liquid of an exceedingly disagreeable odor results. Pure methyl alcohol, when treated in like manner, yields a clear, colorless liquid with a pleasant ethereal odor.

B. TEST FOR IMPURITIES INTRODUCED THROUGH SALICYLIC ACID.

On the impurities of artificial salicylic acid much has been written. It was no very difficult matter to observe that the early synthetic acid placed upon the market contained impurities (Williams, Squibb and others). It was somewhat more difficult to state definitely what some (not all) of these impurities were (Dunstan*), and to ascertain whether the ones isolated were therapeutically objectionable or not (Charterist† and others). The greatest difficulty, however, is encountered in devising ways and means (Prescott,‡ Ewell,‡ Hesse,§ Fischer|| and others) for practical tests for pharmacopœial use. A good review of the subject up to 1890 will be found in the paper by Dunstan and Bloch.¶

As to the use of artificial salicylic acid, which alone can come into consideration as far as the manufacture of artificial oil of wintergreen is concerned, Schimmel & Co. reported as early as 1890** that although they did not believe that 0.5 to 1.0 per cent. of cresotinic acid, found by B. Fischer even in salicylic acid used for medicinal purposes, could be regarded as objectionable in the manufacture of methyl salicylate, they preferred to use an acid that was absolutely free from cresotinic acid.

Dr. Kleber in his recent letter calls attention to the fact that the objectionable impurities, which enter the salicylic acid through the carbolic acid used in its synthesis, can be avoided if salicylic acid is made from carbolic acid made in turn from benzene purified by crystallization.

The last edition of the United States Pharmacopœia relied principally on the melting point for the determination of the freedom of the salicylic acid from cresotinic acids. The volumetric method proposed by Prescott and his students, and modified by B. Fischer, so as to reduce the large errors due to slight differences in weighing, does not seem to have met

* Pharm. Journ., 50, p. 429.

† *Ibid.*, p. 436.

‡ Proc. A. Ph. A., 36, p. 78.

§ *Ibid.*, 37, p. 265.

|| Pharm. Ztg., 34, p. 327.

¶ Pharm. Journ., 50, p. 429.

** Bericht S. & Co., Apr., '90, p. 45.

with much favor as a practical method. The writer would appreciate it as a great favor if persons who have had experience with this or other methods were to communicate their results to him.

C. EMPIRICAL TESTS.

(a) N. Wender's (1891) furfurol test* for distinguishing between volatile oils is a color test without any scientific basis and was found unreliable as an empirical test by F. B. Power † (1892).

(b) As late as 1898, Adrian ‡ based a color test with sulphuric acid on the supposed presence of a "terpene" in the natural oil of wintergreen.

Alcohol. Pettigrew § was informed by Kennedy, who had visited the distilleries, || that the distiller always added a certain amount of alcohol to his product before sending it to market. The Committee on Adulterations and Sophistications of the American Pharmaceutical Association for 1875 reported ¶ that a quantity of wintergreen oil, obtained from a New Jersey distiller and claimed to be absolutely pure, contained "just two-thirds of its volume of alcohol." How the alcohol was identified is not mentioned.

Trimble and Schroeter** in 1889 found "small quantities" of ethyl alcohol and benzoic acid in a saponified "natural" oil. Whether the ethyl alcohol was present as such or as ethyl benzoate (see below: benzoic acid esters) does not become apparent from the investigation.

Inasmuch as alcohol seems to have been used as an adulterant ever since volatile oils have been distilled, the tests for its detection are numerous. Here only those will be mentioned of which the literature on the subject shows that they have been applied specifically to "wintergreen oil," natural and artificial.

(a) The fuchsine test as a means of distinction between natural and artificial wintergreen oil has already been referred to. (See page 380.) The test was based upon the solubility of fuchsine in alcohol and its supposed insolubility in volatile oils. That this latter assumption is not correct has been repeatedly shown, also that dark oils which do not dissolve fuchsine may hide the fuchsine color if alcohol is present. For a brief review of this subject comp. Fehling's "Neues Handwörterbuch d. Chem.," vol. 4, p. 838.††

* Zeitsch. d. allg. öst. Apt.-Ver., 29, p. 359.

† Pharm. Rev., 10, p. 8.

‡ Apt. Ztg., 13, p. 540; from Journ. de Ph. et Chim., [6], 7, p. 422.

§ Pharm. Rev., 8, p. 40.

|| Account in Proc. A. Ph. A., 31, p. 399.

¶ Proc. A. Ph. A., 23, p. 506.

** Am. Journ. Ph., 61, p. 403.

†† Also Ph. Rev., 10, p. 8.

(β) The U. S. P. (1880) test for alcohol is as follows: "When heated on a water-bath, in a flask provided with a suitable condenser, it should yield no distillate having the characteristics of alcohol."

More detailed directions are given in G.-H.-K., "The volatile oils," p. 200: "For the definite identification of alcohol the suspected oil is heated until it just begins to boil* and the first few drops that come over are collected in a test tube and filtered, to remove any oil globules which may also have come over, through a filter moistened with water. The filtrate is made strongly alkaline with dilute potassa solution and treated, after heating to 50–60°, with a solution of iodine in potassium iodide, until the solution remains slightly yellow. If alcohol is present, small crystals of iodoform will separate in a short time at the bottom of the liquid. It must here be remembered that other bodies, such as aldehydes, acetone and acetic ether, also yield iodoform under the given conditions."

(γ) A common test for alcohol is to drop the suspected oil into water. If alcohol is present, the drops do not remain clear and transparent, but become opaque and milky.

Larger amounts of alcohol may be removed from volatile oils by shaking with water, from which the alcohol may be again removed by distillation and identified by the iodoform reaction. If the shaking out is done in a graduated cylinder, the increase of the watery layer corresponds approximately to the amount of the alcohol.

According to Hager it is better to use glycerin, because with this the two layers separate better and a more accurate reading is possible.

The alcohol content may also be approximately calculated if the specific gravity is determined before and after shaking with water.

Benzoic Acid Esters. In 1889, Trimble and Schroeter† report that they isolated a small amount of benzoic acid from saponified wintergreen oil. They also found small amounts of alcohol, thus leaving readers to infer the possible presence of ethyl benzoate as a regular constituent of natural wintergreen oil. Inasmuch as other investigators failed to find these substances in pure oils and since neither benzoic acid nor ethyl alcohol are mentioned as constituents of wintergreen oil by Sadtler and Trimble in their "Pharmaceutical and Medical Chemistry" (p. 787), it seems more likely that the substances found were added in the form of ethyl benzoate for the purpose of adulteration.

In 1890 Schimmel & Co.‡ examined a commercial oil which they found to contain methyl benzoate (oil of Niobe) to the extent of 50 per cent. A half year previous the same firm questioned the probability of such an adulteration because the specific gravity of the esters of benzoic acid is so

* "Alcohol is not removed by heating on a water-bath."

† Am. Journ. Pharm., 61, p. 398.

‡ Bericht S. & Co., Oct. '90, p. 47.

much lower than that of the corresponding salicylic acid esters, as is shown by the following table : *

	Sp. gr. at 15°.	B. P.†
Methyl benzoate.....	1.0950	197.5—199.5°
Methyl salicylate (anhydrous)	1.1870	219 —221°
Ethyl benzoate	1.0550	211.5—212.5°
Ethyl salicylate.....	1.1345	231 —232.5°

As an adulterant this ester can scarcely come into consideration any longer, since, according to Dr. Kleber, methyl salicylate is at present about 10–15 cents cheaper than methyl benzoate.

Chloroform. In 1873 W. H. Pile† “called attention to a sample of oil of gaultheria, which seems now to be pressing on the market.” The chloroform was detected by the low specific gravity and boiling point of the oil and by the odor of the adulterant. C. Bullock, in the course of the discussion, stated that he had met with two cases of such oil, and that the chloroform had been separated by fractional distillation.

In 1876 the Committee on Adulterations of the American Pharmaceutical Association‡ reported that wintergreen oil adulterated with chloroform and oil of sassafras had been found in the market. “A mixture of 4 parts of oil of sassafras and 1 part each of chloroform and oil of wintergreen” is said to have the same specific gravity as oil of wintergreen. It is possible that this is the same case reported by Pile. In both instances sassafras oil is mentioned with the chloroform as adulterant.

E. R. Squibb,|| in a general review of the subject of wintergreen oil, in 1887, states that “the chief adulterants are chloroform and oil of sassafras.” It does not appear, however, that he has found either of these adulterants in commercial oils himself, but his statement is apparently based upon the one above.

The United States Pharmacopœia (1890) test for alcohol applies also to chloroform. The more detailed process of G.-H.-K. (see p. 383) can likewise be used, but in place of the iodoform test for alcohol, the Prussian blue or the phenyl isocyanide tests for chloroform should be substituted.

Large amounts of chloroform can also be detected by dissolving the oil in caustic potassa solution.

Sassafras Oil. The story of sassafras oil as adulterant of wintergreen oil is closely associated with that of chloroform. As in that case

* Bericht S. & Co., Apr. '90, p. 45.

† Thermometer entirely in vapor.

‡ Am. Journ. Ph., 45, p. 521.

|| Proc. A. Ph. A., 24, p. 406; from Chem.-Techn. Repert., 1874, p. 268. Unfortunately this number of the Repertorium is not available, so that the original article could not be traced.

the entire literature on the subject seems traceable to one adulterated lot, and there no chemical identification seems to have been attempted.

The National Dispensatory † makes the statement that "The most common adulterant is oil of sassafras," but also without any reference to any particular case.

Like other non-phenol oils it can be detected by the solubility test in aqueous alkali. (Comp. petroleum.)

Maisch's suggestion ‡ (1873) to apply the nitric acid test for sassafras oil, like most color tests with acid, can scarcely be accepted as satisfactory. However, it was the official test of the United States Pharmacopœia (1880). It was shown to be unsatisfactory by F. B. Power § in 1892, and was replaced in the 1890 edition of the United States Pharmacopœia by a less empirical test.

Camphor Oil. In 1885 P. Macewan || made the following statement: "From the United States we hear that large quantities of this oil (viz., camphor oil) are being received there, and that it is being used for the adulteration of oil of wintergreen." However, no record of the actual finding of camphor oil in a commercial sample seems to have been made to substantiate this rumor.

In commenting on this report, Schimmel & Co. ¶ state that their New York branch had not met with an oil of wintergreen thus adulterated.

Camphor oil should be detected like other non-phenol oils. (Comp. petroleum.)

The test given in the U. S. Dispensatory ** to drop the suspected oil in water is neither specific nor reliable.

Recently Parry †† made the following statement concerning this adulterant: "The light oil of camphor is used to a considerable extent for the adulteration of the more valuable essential oils, in this way partly superseding the coarser adulterant, turpentine. I have found this to be specially the case with peppermint and eucalyptus. More rarely have I met with samples of wintergreen adulterated in this manner." The method of detection, however, is not given.

Petroleum. In 1889, F. B. Power ‡‡ found that an oil which was guaranteed as strictly pure but had a suspiciously low specific gravity, contained

* Ephemeris, III, p, 954.

† 5th ed. (1894), p. 1124.

‡ Am. Journ. Ph., 45, p. 521.

§ Pharm. Rev., 10, p. 9.

|| Pharm. Journ., 44, p. 1045; also Am. Journ. Ph., 57, p. 409.

¶ Bericht S. & Co., Apr., 88, p. 42.

* 16th ed., p. 937.

†† C. & D., 61, p. 520.

‡‡ Pharm. Rev., 7, p. 286.

almost 5 p. c. of kerosene. This was separated readily from the saponified oil and identified by its odor, sp. gr., boiling temperature, negative behavior toward strong nitric and sulphuric acids, and elementary analysis.

The use of petroleum as an adulterant of cassia and citronella oils had previously been pointed out. Although this is the first positive instance of the use of petroleum as adulterant of wintergreen oil. Power assumes that an observation recorded by Squibb * in 1887 can be explained by assuming the presence of petroleum in other commercial oils previously examined and found to begin to distill below the b. p. of methyl salicylate.

The U. S. P. test can be applied for the isolation of petroleum. This was evidently first suggested by F. B. Power in 1892.† The substitution of potassium hydroxide for sodium hydroxide, suggested by C. Kleber, however, is advisable. Dr. Kleber states in his letter: "The sodium compound of methyl salicylate is difficultly soluble in water and is precipitated even if very dilute sodium hydroxide solution is used. The resolution upon the application of heat is effected only with saponification of the ester. The potassium compound, however, is readily soluble. If the solution is prepared cold it precipitates, upon the addition of an acid, the ester. Upon prolonged standing the ester is slowly saponified, rapidly when heated. The potassium compound is, therefore, better adapted to the detection of substances that are decomposed when heated with aqueous alkali, as *e. g.* bezoic acid esters. Finally, it should be remembered that potassium methyl salicylate and potassium salicylate possess a great capacity to dissolve a number of substances, hence dilute solutions should be used."

Turpentine Oil. In 1898 Martha M. James examined a number of commercial samples of wintergreen oil in connection with her investigations on the assay of the oil.‡ The results of these examinations have not previously been published. Of the eleven oils examined at that time, two contained almost 15 p. c. of turpentine oil. (Comp. Table, oils 1 and 6.) One of the oils was contained in a bottle on which the jobber had pasted a label closely imitating that of a reputable manufacturer. In both instances the turpentine oil was readily separated from the soda solution in which the methyl salicylate had been dissolved. It was identified by odor, boiling temperature and by the preparation of pinene nitrosochloride.

Carbolic Acid. Although this substance is not likely to be used as adulterant, traces of it may occasionally be found in a commercial synthetic article. A. R. L. Dohme § in 1899 called attention to the pos-

* Ephemeris, III, p. 953.

† Pharm. Rev., 10, p. 9.

‡ See Pharm. Rev., 16, p. 130.

§ Proc. A. Ph. A., 48, p. 760; from Proc. Maryland Ph. Assn., 1899, p. 98.

sible presence of phenol, and suggested its detection by its odor after a drop of the suspected oil had been placed on bibulous paper.

That phenol should exist as such in the synthetic salicylic acid used in the manufacture of artificial ester is not probable. In the process of manufacture, however, of the ester a phenol odor is sometimes developed.*

Dr. C. Kleber, in his recent communication, explains the formation of phenol in the following manner: If the salicylic acid is not completely removed from the crude ester product, it may be decomposed to phenol and carbon dioxide ($C_6H_4.OH.CO_2H = C_6H_5.OH + CO_2$) when the crude oil is rectified with high tension steam at temperatures above 100° . Such a product cannot be freed from the phenol, but must be saponified and the regenerated salicylic acid purified.

He suggests the following test for phenol: A small amount of the oil is saponified in a test tube with aqueous alkali. A few Cc. of concentrated soda solution are added and the mixture shaken. A sufficient amount of sulphuric acid (1 : 3) is then added to produce a decided effervescence, but not enough to produce a permanent precipitation of the salicylic acid. Phenol can thus be detected by its odor.

Among the oils examined by Martha James, one had a slight odor of phenol. When assayed according to the alkalimetric method it yielded 90.8 and 90.6 per cent. respectively of methyl salicylate; according to the iodometric method, however, 100.8 per cent. (oil 10 of table). The high percentage according to the second method can readily be explained by the larger amount of iodine with which phenol will combine.

* There is no reason to suppose that salicylic acid pure and simple will behave differently toward reagents whether produced in a plant or in a chemical laboratory. It is possible, however, that the artificial acid may be contaminated with small amounts of impurities, *e. g.*, salol which in some step of the process of manufacture or purification may yield phenol.

No.	Sp. Gr.*	α †	Percentage of Methyl Salicylate.	Solubility in 10 p. c. Soda Sol.	
1.	1.127	+3°	87.4† p. c. 87.8† " 87.1† "	Oily layer formed.	The insoluble oil was fractionated and identified as turpentine oil by odor, boiling point and by the pinene nitrosochloride reaction.
2.	1.183	Inactive	99.3 " 99.4† "	Sol.	
3.	1.178	"	100.1 " 99.8 "	Sol.	
4.	1.172	"		Sol.	The insoluble oil was identified as turpentine oil as above.
5.	1.178	"	98.04 "	Sol.	
6.	1.121	+	85.7 "	Oily layer.	
7.	1.18	Inactive	98.8 "	Sol.	This sample was labeled: Oil of wintergreen leaves. It possessed the characteristic odor of true wintergreen.
8.	1.179	"		Sol.	
9.	1.181	"	99.88 "		
10.	1.169	"	100.8† " 90.8 " 90.6 "		This oil had a faint odor of phenol.
11.	1.177	"	99.3† " 99.3 " 99.6 "		

* Specific gravity and rotatory power were determined at about 20°.

† Angle of rotation in a 100 mm. tube.

‡ Assayed according to iodine method. Those not marked with ‡ were assayed by saponification with an excess of alcoholic potassa and titration with N/1 HCl V. S.

The writer is indebted to Dr. Clemens Kleber, whose experience in the manufacture of salicylic acid and methyl salicylate and the examination of commercial wintergreen oil render his co-operation especially valuable.

THE CHAIRMAN: You have heard Mr. Kremers' remarks on this knotty question. I have frequently run up against it, and have found it quite annoying.

MR. BARTLEY: The quickest way to get at this matter is to call for an informal vote on this subject, without binding the Association; that is my idea. This is not a new subject, it has come up before.

THE CHAIRMAN: We ought to receive the paper first.

Mr. Good moved to receive and refer for publication, and it was so ordered.

MR. LLOYD: We have had this morning three papers all bearing on the same subject. Now it seems to me as if the entire matter is simply a question of fairness—of synthetic fairness and justice, man to man. It seems to me they should be all included. One paper asks the question, Are we justified in selling under the label "Oil of Almond" the expressed oil of bitter almond, the expressed oil of peach seed, the expressed oil of apricot kernel?—are we justified in doing that? It is simply a question of, Are we justified in doing wrong? Does the American Pharmaceutical Association oppose the wrong of

mis-labeling things?—that is the question. Are we justified in labeling oil of birch oil of wintergreen? Do we put ourselves on record as opposing the labeling of artificial oil of wintergreen oil of wintergreen, when it is not oil of wintergreen? It seems to me as though there is no other side to this question than that of the side of right—that the man who makes oil of birch should be forced to label it oil of birch, that the man who sells it should sell it as oil of birch; it should be oil of birch, and nothing but that. The salicylic acid made from that should be labeled salicylic acid of oil of birch. It looks to me, my friends, as if this subject of substitution is one of right and wrong. Is it right to substitute one substance for another? As Mr. Hallberg has said, this stuff that is sold as creosote is not creosote. Then should the dealer be allowed to sell it as creosote and the doctor give it as creosote, under the sanction of this Association and that of the Pharmacopœia? No. It looks to me as though one good work the government will do now will be to help to stop this thing and assist the Pharmacopœia Committee. As for myself I say, if a thing be oil of birch, label it oil of birch. The American Pharmaceutical Association should go on record in this matter.

MR. LYONS: There is one further question that comes up in this connection. Physicians constantly call for oil of wintergreen as a flavoring agent, and it makes no difference with them whether it is oil of birch or oil of wintergreen. They do not know the oil of birch, and it would be very difficult to get them to prescribe it, whereas they have been in the habit of writing oil of wintergreen. The remedy is simple. If the Pharmacopœia recognizes as the equivalent of oil of gaultheria, U. S. P., oil of birch, that would make it its equivalent, and permit the dispenser to use oil of birch when oil of gaultheria is prescribed.

MR. KRAEMER: In view of the general nature of this question, it seems to me it would be wise to dispose of it by the appointment of a committee of this Section to consider this matter and see what rules can be devised or regulations formulated that will enable us to do what is proper about it. Ordinarily what we understand by substitution is an intentional use of some one thing in the place of another. Here is a matter largely of nomenclature, and if it meets Mr. Kremers' approval, it seems to me it would be a wise thing to have a committee consider it and report at the next meeting of the Association.

MR. GOOD: This is certainly a very important question, and we do not want to plant ourselves in direct opposition to, or in line against, progress in synthetic chemistry. Of course we know that sometimes a cheaper product is substituted for a better or more expensive one; but the question is, on the attitude we are to assume on synthetic products. We cannot condemn synthetic acids or the various synthetic alkaloids. Shall we condemn cocaine or condemn pilocarpine, which has been reduced in price from thirty cents a grain to six or seven? We should not plant ourselves as in opposition to progress, or as against the great benefits to be derived from the results attained by these world-renowned chemists, and against the good they are doing for us in giving us synthetic products which are practically equivalent to natural products. I am not referring now to the so-called synthetics, but to synthetic chemistry.

MR. HALLBERG: I want to offer a substitute for the motion made by Mr. Kraemer, and refer this matter to a committee—preferably a committee of one, Mr. Kremers—which shall present this subject and the sense of this Section, as closely as it can be done, to the Committee on Revision of the Pharmacopœia, so that some action may be taken now along these lines, without waiting until next year's meeting of the Association.

Mr. Bartley seconded this motion.

MR. KREMERS: There is in this matter really an element of substitution. I do not

wish to exaggerate it, but there is a small element of this sort in it. The distiller of sweet birch oil who advertises it as oil of wintergreen knows why he does it. The difference between the two oils may be extremely small, and yet when it comes to the exact flavor there is a great difference in the estimation of those who know the flavor. I simply throw this out as stating a fact. Another point I wish to emphasize is this: The last Revision Committee has done just what Mr. Lloyd advocated, and yet the Committee has been criticised and their action commented upon unfavorably. You can readily understand that the Revision Committee, or the special sub-committee upon whom this work largely falls, is anxious to get the opinions of the members of this Scientific Section, whether put in the form of a vote or expressed in some other way. These two facts I wish to bring out.

Mr. Hallberg's motion was then put and carried.

MR. BARTLEY: I understand the committee is to be appointed to convey the general sense of this meeting to the Committee on Revision?

THE CHAIRMAN: Yes, sir.

MR. BARTLEY: How is that to be gotten at?

THE CHAIRMAN: There is no way that I am aware of but the method used by the good Quakers, that the clerk shall write down, it seems to be the sense of this meeting so and so.

MR. KREMERS: I believe Mr. Bartley made the motion that oil of wintergreen be retained in the Pharmacopœia?

MR. BARTLEY: I would prefer that Mr. Kremers formulate motions upon certain points that he wishes an opinion upon. The Committee should have some instruction. I move that Mr. Kremers be asked to formulate questions that he wishes a positive opinion upon.

The motion was seconded by Mr. Vaughan and carried.

MR. KREMERS: I should like to have an expression upon the proposition of retaining oil of wintergreen from *gaultheria procumbens* in the Pharmacopœia.

A vote was had, and the affirmative of this proposition was carried.

Mr. Kremers then asked for an expression as to whether methyl salicylate should be retained in the Pharmacopœia.

MR. HALLBERG: Under the synonym of artificial oil of wintergreen, or without it?

MR. KREMERS: That opens another matter. The statement has been made that nobody ever thought of calling methyl salicylate synthetic oil of wintergreen except the business firms who wanted to substitute it in place of the natural oil. Now I have here extracts from a paper of Prof. Procter and Mr. Cahours on this subject. Mr. Cahours was the one who originally investigated oil of wintergreen, and prepared methyl salicylate artificially. He says in 1843:

"It becomes apparent from the preceding account: 1st, That analysis and synthesis agree in establishing the identity of the oil of wintergreen and methyl salicylate.

"I have, finally, assured myself that these strange properties (the acid properties of the normal ether, oil of wintergreen, E. K.) are also characteristic of the oil obtained by distilling salicylic acid with a mixture of wood alcohol and concentrated sulphuric acid"

(i. e. of artificial methyl salicylate or oil of wintergreen, E. K.).—Journ. de Ph. et de Chim. [3] 3, p. 364.

Procter, who in 1843 followed up Cahours' work on the chemical composition of wintergreen oil with an examination of oil of sweet birch, makes the following statement:

"The results of my experiments tend to prove, 1st, The identity of this volatile oil (oil from *Betula lenta*, E. K.) with the oil of *Gaultheria procumbens* (salicylate of methylene)."—Am. Journ. Pharm., 15, p. 243.

MR. HALLBERG: I favor the retention of methyl salicylate in the Pharmacopœia, but I would be opposed to the synonym for it, artificial oil of wintergreen, because that would at once open the door for substitution.

MR. KREMERS: Shall artificial methyl salicylate be retained in the Pharmacopœia?

The chair put the question and it was decided in the affirmative.

MR. HALLBERG: Now the question is, Shall the term—or synonym—"artificial oil of wintergreen" be applied to methyl salicylate?

A vote was had and the query decided in the negative.

MR. BARTLEY: There is one other point that Mr. Kremers desires an expression on, I believe, and that is, whether we should advocate or permit the synonymous terms oil of wintergreen and oil of birch—whether we should allow them, or advocate the synonymous use of the two terms. That would really amount, of course, to advocating the substitution of oil of birch for oil of wintergreen.

MR. KREMERS: I would like to have an expression on that.

MR. STEVENS: It seems to me that statement simply amounts to dropping oil of wintergreen from the Pharmacopœia and retaining oil of birch.

MR. BARTLEY: That question has already been voted on, to retain oil of wintergreen, and carried in the affirmative. The question is, Shall we advocate or approve of this substitution?—or of the use of the terms oil of birch and oil of wintergreen as synonymous?

The chair was about to put the vote, when Mr. Vaughan said he did not understand the query.

THE CHAIRMAN: The question is, whether we would approve of placing in the Pharmacopœia, for example, under the term oil of wintergreen, oil of birch; or reverse it, and put under oil of birch the term oil of wintergreen; in other words, use them as synonymous terms. So far as the analysts are able to see, they are identical, except, perhaps, in their effect on the nasal organ—the mucous membrane. Now, if they are so nearly identical, is it not possible to make them synonymous?

MR. HALLBERG: The most important point in connection with this subject, to my mind, is the administration of oil of gaultheria in large doses—as much as one Cc. I would like to ask whether, according to Mr. Bartley's experience, oil of birch has the same therapeutic effect in such doses as the true oil of gaultheria?

MR. BARTLEY: I never know which I am getting. The evidence before us this morning is, that when we prescribe oil of gaultheria we really get oil of birch, or perhaps artificial methyl salicylate. So I do not think any physician in general practice is able to

answer that question. He has no means of controlling it. He writes for one thing and invariably gets another. If there is no such thing as supplying the market with genuine oil of wintergreen, why not cut it out entirely and only put in oil of birch, or make them synonymous?

MR. RUSBY: I would like to inquire what becomes of the oil of wintergreen distilled in the State of New York and elsewhere? There is a large amount distilled. Does it go into candies?

THE CHAIRMAN: I confess I do not know.

MR. RUSBY: Dr. Lawrence Johnson, for many years one of our leading medical botanists, told me many years ago that a person might just as well take one of these things as another—that it made no difference whether oil of wintergreen, oil of birch or methyl salicylate. He had never then had rheumatism himself, but he had given these oils to a great many of his patients, and concluded that the effect was the same. Some years after that, I told him that I was suffering greatly from rheumatism. In the meantime, he had himself been a severe sufferer from this disease. He now said, "You take oil of wintergreen and you will get well. See to it that it is the natural oil and from wintergreen, not from birch." This latter advice came from a man who had himself been suffering, and who had experimented on himself. I agree with Mr. Hallberg that the actions of these products are not the same, and until we know that they are the same, I think we shall be justified in retaining them distinct.

MR. BARTLEY: I did not mean to intimate that the natural and the artificial oils gave the same result. I have seen a difference there myself, but not as to the other oils.

MR. LLOYD: If the Pharmacopœia names oil of wintergreen, it will be made, and I think oil of birch should be so designated. The three will then be found there as separate and distinct—oil of wintergreen, oil of birch and synthetic methyl salicylate.

MR. KREMERS: One reason for making the distinction between oil of wintergreen, oil of birch and artificial methyl salicylate might be found in the fact that in the French journals it has been claimed that oil of wintergreen is an irritant, and not as good as methyl salicylate. So there would seem to be some difference.

MR. LLOYD: It seems to me this matter is pretty badly mixed, and should be referred to a committee, with power to act.

MR. BORING: I say, let each one of these things be represented in the Pharmacopœia as official, with appropriate text, and then let the physician use what he pleases, and no substitution can be charged to any one. If the physician wants oil of birch, let him write it; if he wants oil of gaultheria, let him say so; if he wants methyl salicylate, let him state it.

MR. BARTLEY: I am just informed by Mr. Kremers that the Revision Committee of the Pharmacopœia have been criticised by the editors of the pharmaceutical journals upon the very fact that the Pharmacopœia is just as it is. But it does not matter what you do, it will be criticised by somebody.

MR. GOOD: The revisers of the Pharmacopœia have come here and asked your advice. Do not fling this thing back at them. The attitude taken by one of the gentlemen here is the correct one. If these products are good, why not say so? If it is black, say so; and if it is white, call it white. Say just what it is, and leave it there.

MR. HALLBERG: I believe we can clear the subject up now. I believe the majority

are in favor of the proposition outlined by Mr. Boring. We want to place ourselves on record as against any interchange or synonymous use of titles. It has already been decided this morning that the synonym artificial oil of wintergreen shall not be officially applied to methyl salicylate. Now, the question of Mr. Bartley is this, in effect, if I understand him: Whether the official designated source or derivation of oil of gaultheria shall be confined to gaultheria procumbens.

MR. BARTLEY: That is it, and I withdraw my motion in favor of that query.

The question was put and carried in the affirmative.

MR. HALLBERG: Now, shall the official designated source or derivation of oleum betulae volatile be confined to the betula lenta?

MR. KREMERS: There is a good deal of prejudice on this subject. I want to ask this question: Are we going to define quinine obtained from such and such a species of cinchona as one article of the Pharmacopœia, while the same substance made from another variety of cinchona is to be another article of the Pharmacopœia?

The query of Mr. Hallberg just presented was put to a vote by the chair, and was decided in the affirmative.

The chair then called on Mr. Kremers for his other paper, upon oil of cloves, but the gentleman said he had already taken up too much of the time of the Section, and would not present it even in abstract. The text of the paper was as follows:

OIL OF CLOVES—A PROBLEM IN PHARMACOPŒIAL REVISION.

BY EDWARD KREMERS.

The United States Pharmacopœia makes the following statements about oil of cloves, which appear to be deserving of special attention at the present time:

OLEUM CARYOPHYLLI—OIL OF CLOVES.¹⁾

A volatile oil²⁾ distilled³⁾ from Cloves.⁴⁾

It should be kept in well-stoppered bottles, in a cool place, protected from light.⁵⁾

A pale yellow, thin liquid, becoming darker⁶⁾ and thicker⁷⁾ by age and exposure to the air,⁸⁾ having a strongly aromatic odor⁹⁾ of cloves, and a pungent and spicy taste.⁹⁾

Specific gravity: 1.060 to 1.067 at 15° C. (59° F.)⁹⁾

Soluble in an equal volume of alcohol,¹⁰⁾ this solution being slightly acid to litmus paper,¹¹⁾ also soluble in an equal volume of glacial acetic acid.¹²⁾

When shaken with an equal volume of a concentrated solution of potassium hydrate, or of stronger ammonia water, it forms a semi-solid, yellowish mass.¹³⁾

If 2 drops of the oil be dissolved in 4 Cc. of alcohol, and a drop of ferric chloride T. S. added, a bright green color will be produced; and if the same test be made with a drop of dilute ferric chloride T. S., prepared by diluting the test-solution with four times its volume of water, a blue color will be produced, which soon changes to yellow.¹⁴⁾

If 1 Cc. of the oil be mixed with 2 Cc. of a mixture of 2 volumes of alcohol and 1 volume of water, it should form a clear and perfect solution (absence of petroleum, most fatty oils, oil of turpentine, and similar oils).¹⁵⁾

If 1 Cc. of the oil be shaken with 20 Cc. of hot water, the water should show a scarcely perceptible acid reaction to litmus paper.¹⁶⁾

If, after cooling, the aqueous layer be passed through a wet filter, the clear filtrate should yield, with a drop of ferric chloride T. S., only a transient grayish-green, but not a blue or violet color (absence of carbolic acid).¹⁾)

1) Oil of cloves is official in all pharmacopœias used in the compilation of Hirsch's "Universal Pharmakopœe;" but, whereas all pharmacopœias but one recognize by this name the volatile oil proper derived from cloves, the German Pharmacopœia defines *Oleum Caryophyllorum* as "eugenol," the oxygenated constituent of the essential oil of cloves.

Comp. also oil of cloves stems, No. 4.

Oil of clove bark is derived from a plant of a different natural order.*

2) Quantitatively, and possibly also for therapeutic purposes, the principal constituent of oil of cloves is eugenol, a phenol $C_{10}H_{11}O.OH$, of which from 70 to 85 p. c. are present. In addition to free eugenol, there appears to be present the acetic acid ester, acetoeugenol, also the eugenol ester of acet-salicylic acid. The presence of the latter is claimed to account for the presence of salicylic acid in the oil.

Quantitatively second in importance is the sesquiterpene caryophyllene, $C_{15}H_{24}$. Other minor constituents are methyl alcohol, furfurol, methyl amyl ketone and vanillin. The fatty ketone is said to impart to the oil its peculiar fruity odor as distinguished from the more heavy eugenol odor.

For references to original accounts comp. G.-H.-K., "The volatile oils," p. 514.

3) "The cloves are distilled either whole or in a comminuted condition; according to the method of distillation (water or dry steam) there is obtained an oil of higher specific gravity and richer in eugenol, or a lighter oil, in which the non-phenol constituents are relatively larger."[†]

The amount of oil of cloves used as a medicinal agent is but small as compared with that used for other purposes. Normal oil of cloves is obtained by bulking all distillates, both light and heavy. Inasmuch as there is legitimate demand for different fractions of the oil for various purposes, some manufacturers collect the distillate in fractions and store these separately. From these fractions the desired commercial article, *e. g.*, U. S. P. oil, is made up by bulking according to a certain formula established by long experience. In this manner an oil of practically the same density will be obtained, although the cloves may vary or changes in the method of distillation produce a somewhat different product, when completely bulked.

That the kind of distillation, water or dry steam, will produce different results has already been mentioned. The rapidity of the distillation, likewise, seems to affect the product. Thus the introduction of better condensers, enabling a more rapid distillation, has resulted in an increased yield of a lighter oil.

* G.-H.-K., The volatile oils, p. 393.

† G.-H.-K., The volatile oils, p. 513.

4) "Cloves" are defined by the U. S. P. as "the unexpanded flowers of *Eugenia aromatica* (Linné), O. Kuntze, nat. ord. *Myrtaceæ*."

Zanzibar and Pemba produce about four-fifths of the clove product of the world. These cloves, yielding about 15–18 p. c. of oil, are reported to be the only commercial varieties used in the manufacture of the oil. Cloves, originally indigenous to the Philippines, are also cultivated on Amboina, Réunion, Mauritius, Madagascar and Malacca (Penang). Of these the most expensive is the Madagascar clove from Ste. Marie on the southern point of the island. It is reported to yield 18 p. c. of oil, which is considered finer than Zanzibar clove oil by Parisian perfumers. Amboina and Réunion cloves are also richer in oil than Zanzibar cloves, but the difference in yield is stated not to be sufficient for the difference in price of the cloves, due to their better appearance.*

Cloves are officinal in all pharmacopœias, but, whereas most of them do not specify the volatile oil content, the Italian Pharmacopœia demands an average of 18–20 p. c., and the Russian up to 20 p. c. Inasmuch as a method of assay is not given, a direct comparison with the results of distillation may not be warranted. If the distillation method is implied, it would seem to follow that only the very best grade of cloves were admitted as official. That these should be used for the distillation of the oil seems doubtful.

The above definition, therefore, excludes the oil from clove stems which are an article of commerce. According to Schimmel & Co.† the oil of cloves of the German market previous to 1875 seems to have been distilled almost exclusively from clove stems. In order to emphasize the difference, Schimmel & Co., reported regularly for a time on "clove oil from cloves" and "clove oil from stems."

That clove stems played an important rôle in the distillation of so-called oil of cloves, becomes apparent from the Hamburg importations as reported in the "Bericht" of Schimmel & Co.‡

The distribution of Zanzibar cloves during the years 1898, 1899 and 1900, are also of special interest when compared with the output of clove stems during the same period.§

It also should exclude the oil from cloves from which the stems have not been carefully removed.|| Although about equally rich in eugenol, the oil from clove stems does not possess as fine an aroma as the oil from the flowers.

* G.-H.-K., The volatile oils, p. 513.

† Bericht, S. & C., Apr., '86, p. 23.

‡ Bericht, S. & C., Sept., '84, p. 18; Apr., '86, p. 23; Apr., '87, p. 23; Apr., '88, p. 31; Apr., '91, p. 34; Apr., '93, p. 45; Oct., '98, p. 38; Apr., '01, p. 43.

§ Ibidem, Apr., '02, p. 42.

|| Comp. offer of cloves mixed with clove stems. Bericht, S. & Co., Oct., '86, p. 23.

5) This precaution is applied to almost all oils.

6) According to the Austrian, Italian and Portugese pharmacopœias, the oil should be "colorless;" according to the British, Spanish and Swedish pharmacopœias, "colorless when fresh;" according to the Belgian and Dutch pharmacopœias, "almost colorless;" according to the German Pharmacopœia, "colorless or yellow;" the other pharmacopœias, included in Hirsch's "Universal Pharmakopœe," admit a yellowish even to brownish color. All pharmacopœias admit a change in color to "brownish," "brown" and "reddish-brown" upon aging.

The formation of the color is supposed to be due partly to the presence of traces of furfurol.* However eugenol seems to become colored even when free from furfurol.†

In 1884, Schimmel & Co.‡ state that they are distilling an extra light oil which is obtained almost water-white, not by rectification, but by a single distillation of the cloves. An absolutely colorless oil can be obtained by the rectification of the crude, dark yellow oil.§

7) The viscosity requirements also vary according to different pharmacopœias. Thus the Danish, Norwegian, Russian and Swedish pharmacopœias describe it as somewhat viscid, the Roumenian Pharmacopœia describes it even as syrupy in consistence.

8) Schimmel & Co.|| in 1889 point out that, whereas it is difficult to distinguish between true clove oil and oil from clove stems by means of the very slight difference in sp. gr., the two oils can readily be distinguished by means of their odor after some practice. As has been pointed out in connection with other oils, the nasal test is one of extreme value to the expert, but of little value to any one else.

9) The specific gravity requirements of the various pharmacopœias are arranged in the accompanying table from the lowest requirement to the highest. The year of publication is added for a better comparison of the changes in this important requirement.

Belgian (1885)	1.030-1.066
Austrian (1889)	} 1.040-1.060
Japanese (1891)	
Roumenian (1893)	
Dutch (1889)	} 1.041-1.061
Hungarian (1888)	
Finnish (1885)	

* G.-H.-K., The vol. oils, p. 515.

† Schmidt, Pharm. Chemie, 4th ed., vol. 2, p. 1214.

‡ Bericht S. & Co., Sept., '84, p. 14.

§ Ibidem, Oct., '86, p. 22.

|| Bericht, Oct., '89, p. 37.

Portugese (1876)	1.047-1.061
British (1898)	Not below 1.050
Swiss (1893)	1.055-1.065
Russian (1891)	1.06
Danish (1893)	} 1.060-1.065
Norwegian (1895)	
U. S. P. (1893)	1.060-1.067

The specific gravity of the German Pharmacopœia, 1.072-1.074, is not comparable with the above, because it is not the specific gravity of the bulked oil, but merely of eugenol, one of the heaviest constituents of the oil. The other pharmacopœias do not state specific gravity requirements.

A casual glance at the above table will reveal the fact that all the pharmacopœias published before 1893, with two exceptions, Russian and Roumenian, require a low minimum specific gravity. The latter exception as to time, is no exception, however, as to requirement. With one exception, the pharmacopœias published in 1893 and 1895 demand a higher minimum specific gravity. The Russian, although published in 1891, belongs in this class. The British pharmacopœia, published in 1898, places its minimum requirement lower than the second class, but not as low as the first class of standards.

That these specific gravity requirements in a general way reflect the results of investigations of the periods represented will become apparent from the data enumerated in the following table. (See pp. 398-9). These are not all the data enumerated in the literature on the subject.

Changes in specific gravity due to differences in temperature were examined by Schreiner and Downer : *

At 10°—1.065	} Difference of 0.0006 for 1° C.
At 15°—1.062	
At 20°—1.059	} Difference of 0.0006 for 1° C.

Corrections for differences of temperature can, therefore, be easily made.

The following additional comments may be of some service.

In 1889, Schimmel & Co.† published the following statement :

“According to our experience, the sp. gr. requirement of the Ph. G. II, viz., 1.041-1.060, is too low. We find 1.067 for clove oil, and 1.063 for clove-stem oil, both at 15°, whereas we have never observed so low a sp. gr. as 1.041 for clove oil from cloves. We may point out the desirability, therefore, that the new edition of the Pharmacopœia, which is being prepared at present, require a sp. gr. of not less than 1.060.”

* Pharm. Archives, 4, p. 167.

† Bericht, S. & Co., Oct., '89, p. 37.

In 1893 we find the following statement : *

"According to an innumerable series of observations, the sp. gr. of oil of cloves is 1.060—1.070 at 15°. To set the standard below 1.060, as is done by the Dutch (1.041—1.060) and the Japanese (1.04—1.06) pharmacopœias, we do not regard as commendable, but would rather regard an oil of the sp. gr. 1.04—1.041 as decidedly suspicious. The distillate from clove stems likewise has a sp. gr. of 1.055—1.065, hence does not differ materially from clove oil from cloves."

After pointing out that the old method of distilling most of the oils in an almost identical manner is unscientific, Schimmel & Co.† in 1895 call attention to the fact that changes in the method of distillation of cloves have resulted in the production of an oil with lighter sp. gr. due to the presence of substances that were previously either destroyed or lost. In place of getting an oil with a sp. gr. 1.060—1.066, they now obtain an oil the sp. gr. of which is 1.050 to 1.055. "We find, therefore, that the sp. gr. of unadulterated oil of cloves may vary from 1.050 to 1.068 at 15°; also that a pure, normal oil, such as is contained in the cloves and such as the consumer unquestionably desires, has a sp. gr. of 1.050—1.056. A slight variation either way in individual cases is not excluded.

"Inasmuch as the Pharmacopœia prescribes a sp. gr. of 1.06, we supply druggists and apothecaries with a fractionated oil, the sp. gr. of which is above 1.06; perfumers and soap manufacturers, however, are supplied with a normal oil."

10) According to the Austrian Pharmacopœia, it should be miscible with alcohol, according to the Ph. Fenn. it should be soluble in spirit of sp. gr. 0.894, according to the Ph. G. in 2 vol. of dilute spirit; the requirements of the Norwegian and Russian Pharmacopœias are like those of the U. S. P.

G.-H.-K. (p. 514) state that it should be soluble in 2 parts of 70 per cent. alcohol, the test with 70 per cent. alcohol being regarded as more characteristic than with a less volume of stronger alcohol. When freshly distilled, oil of cloves is more readily soluble in alcohol than twenty-four hours after distillation and later, thus indicating a chemical change which takes place in the oil upon standing only a short time.

11) Eugenol, in alcoholic solution, appears to have a slightly acid reaction.* The presence of esters in the oil might also account for a slight acidity due to saponification and liberation of free acid (*e. g.*, salicylic and acetic acids). (Comp. No. 2.)

12) The ready solubility of the oil in glacial acetic acid enables the detection of substances less soluble in glacial acetic acid or in a mixture of oil of cloves and the acid.

* Ibidem, Oct. '93, p. 28.

† Bericht S. & Co., Oct. '95, p. 29.

* Hager's Commentary, Vol. 3, p. 222.

13) Eugenol, the principal constituent of the oil, being a phenol, forms phenylates, the potassium and ammonium derivatives being sparingly soluble in the amount of water directed to be used for the test. According to Dünninger,* foreign substances may influence the solidification.

14) This test distinguishes eugenol from ordinary phenol and, therefore, enables the detection of carbolic acid in the oil.

15) The adulterants are insoluble or but sparingly soluble in a solution of clove oil in dilute alcohol.

16) This test would enable the detection of the presence of such heavy oils as oil of cinnamon. The principal constituent of this, the cinnamic aldehyde, readily oxidizes to cinnamic acid, which is soluble in hot water and the presence of which would be indicated by its acid reaction to litmus paper.

17) This test seems to call for no further comment.

At the request of the chair Mr. Schlotterbeck then presented the following two papers, reading them by title, giving a very brief abstract of the first, and submitting them for publication.

THE DEVELOPMENT AND STRUCTURE OF THE SEED OF *STYLOPHORUM DIPHYLLUM*.

BY J. O. SCHLOTTERBECK AND C. R. ECKLER.†

Stylophorum diphyllum is a perennial, herbaceous plant, growing about two feet high in low woods from West Pennsylvania to Tennessee and westward to Wisconsin and Missouri. The pinnately divided leaves vary in size, and many, particularly the lower ones, measure a foot or more in length. The uppermost are in pairs, subtending one or more slender one-flowered peduncles. The flowers are about 2' broad, having four yellow petals. The sepals, two in number, are hairy; corolla yellow. Style distinct, columnar; stigma 3-4 lobed. The pods are ovoid, bristly, 3-4 valved at the base; buds and pods nodding. Juice yellow.

The study was begun upon the ovules of young flower buds, the oldest of which were nearly ready to open. Fig. 1 represents a portion of the placenta torn from the ovary of one of the youngest buds at hand. The little ovules as seen in drawing are quite straight, though some are becoming slightly bent. They measured .11 mm. long by .09 mm. wide, and near the end of each could be seen a very indistinctly simple cellular structure.

A longitudinal section of the ovary from a young flower bud is represented in Fig. 2. The ovules may be seen as they appear in front view, and three in profile attached to placenta. These ovules measured (according to the dotted line) .16 mm. long by .12 mm. wide. At this stage

* *Commentar zur Ph. Helv.*, III, p. 260.

† Part Holder of the Frederick Stearns & Co. Fellowship in Pharmacy. School of Pharmacy, University of Michigan.

two integuments could be seen and also the nucellus in most of them. They were all very much bent, fast taking on their anatropous form. At B may be seen the young bristles on outer wall of ovary. Fig. 3 represents one of the largest ovules, found in this ovary, in profile. The cellular structure was very simple, what was distinct of the integument consisting of two layers of cells. Drawing shows size, shape and position of embryo sac. This particular ovule measured (according to dotted line) .21 mm. long by .11 mm. wide.

Fig. 4 represents an ovule of still higher development measuring (according to dotted line) .31 mm. long by .24 mm. wide. While the ovules at this stage were much more bent than those preceding, represented in Figs. 2 and 3, they had not reached their final true anatropous form.

Fig. 5 represents the cross section of an ovule, from the oldest flower bud at hand, measuring (according to dotted line of Fig. 2) .33 mm. long by .21 mm. wide. The outer integument was composed of two layers of cells. The cells of the outer layer were very regular in size and shape and somewhat wider but not as long as the cells of the inner layer, which were less regular particularly in regard to length. The inner integument consisted of three layers. The cells of the outer layer were longer than those of the other layers and the end walls were generally very sloping. The cells of the other two layers were much the same.

Fig. 6 represents a cross section of the seed coats of a seed measuring .56 mm. long by .39 mm. wide, drawn from the youngest capsule at hand. The cells of the outer coat showed a marked enlargement and also the outer layer of the inner coat, but bearing much the same shape. The cells of the two innermost layers had undergone considerable division and were very irregular in size and shape. In most of the cells could be seen a large round nucleus, some having two, particularly those of the inner layer of the outer coat, and in the outer layer of this coat the nucleus was oval or occasionally club shaped.

Fig. 7 represents in cross section the coats of a seed measuring 1.16 mm. long by .83 mm. wide and from a larger capsule. The cells of the outermost layer had grown very large and those of the layer just beneath were seen to be filled with small crystals of calcium oxalate. The cells of the outer layer of the inner coat had grown to be long and narrow. The cells of the inner layer were somewhat enlarged and had again taken on about the same form as was noticed in Fig. 5, though a little more regular in both size and shape. The cells of the middle layer were considerably enlarged and very much collapsed, though probably a part of this was due to the section cutting. The truer state appears in Fig. 8 which was drawn from a larger seed measuring 1.33 mm. long by .99 mm. wide. At this point the walls of most of the cells had become a trifle thicker, but noticeable particularly in the outer walls of the large epidermal cells. In this layer the cell protoplasm was seen to have become contracted and the

Fig. 1

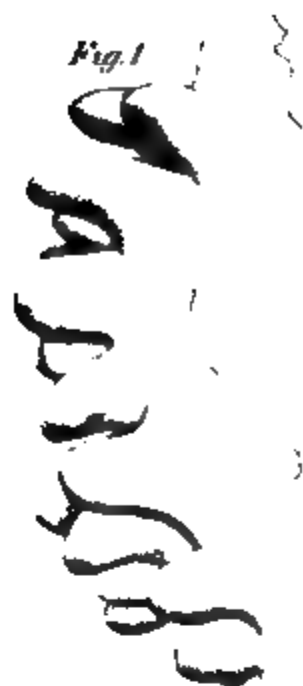


Fig. 3



Fig. 2



Fig. 6

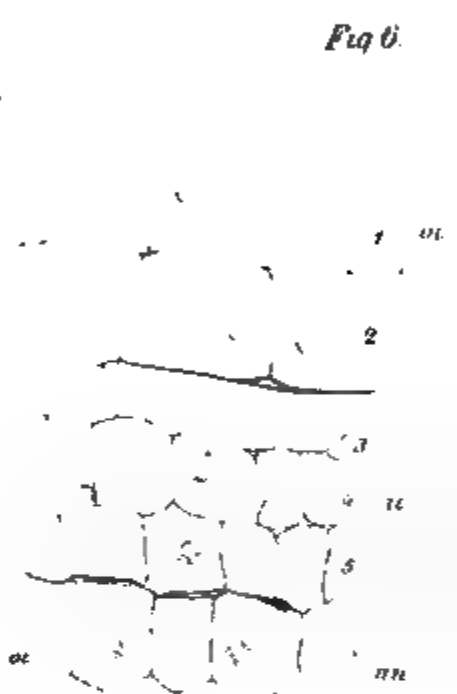


Fig. 4



Fig. 5



Fig. 8



Fig. 7



Fig. 9



Fig. 10



Fig.



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nuclei were generally found in the outer portion of the cells. The cells of the innermost layer had become rounded at the corners making them oval in form.

Fig. 9 represents a similarly cut section of seed measuring 1.3 mm. wide by 1.9 mm. long. The outermost walls had become still thicker and showed small pits on their inner surfaces. The protoplasm of these large cells had become even more contracted and that of the cells from the layer just beneath, which had previously been nearly colorless, had now taken on a light yellow color. The cells of the outer layer of the inner coat had become longer and narrower; those of the middle layer showed a greater state of collapse; those of the inner layer looked much the same as in preceding figure except that the outer walls were less curved.

Fig. 10 represents a like section of a seed measuring 1.6 mm. wide by 2.3 mm. long. The outer walls of the epidermal layer had become still thicker and more deeply pitted, and the pigment layer had become brown. Most of the crystals were seen near the outer part of the cells. Next to these were the outer cells of the inner coat, which had become greatly elongated and extremely narrow, and it was with difficulty that the cross walls could be distinguished. The middle layer of this coat was now seen to be almost entirely collapsed and the innermost layer had collapsed in places (c) also.

Fig. 11 represents a cross section of the coats of a full-grown seed though not thoroughly ripe. The capsule from which it was taken was nearly ready to dehisce. The outer walls of the epidermal cells had become extremely thickened and deeply pitted. The protoplasm, which could no longer be seen, had probably been absorbed. The outer walls laid close to the inner ones, though they did not fit tight against them as we believe they do in the thoroughly ripe seeds. The surface of the outer walls was nearly colorless but the inner surface was light yellow in color. The color of the layer just beneath, or the pigment layer, had deepened and was now of a dark brown, and the cell walls were much thicker than formerly. The inner coat was seen to be almost entirely collapsed. We noticed in studying cross sections of a number of seeds of this age, that in many the collapsed layers did not possess the thickness seen in Fig. 11.

Fig. 12 represents the tangential view of different layers of the seed coat, the numbers corresponding to those of Figs. 11 and 10.

Fig. 13 represents an individual seed in profile, taken from the same capsule as the seeds from which Figs. 11 and 12 were made. It was of a very dark brown color and distinctly crested, the little depressions being of various shapes depending upon cells (1) of Fig. 12. The strophiole was seen to consist of many large thin-walled cells which were gorged with a colorless cell content. The outer cells were arranged in rows, as may be noticed in drawing, and resembled droplets of water, but the cells beneath

were very loosely arranged with many large intercellular spaces. This seed was drawn with a magnification of a trifle over eight diameters, though with the naked eye one can, with difficulty, see the little depressions, while the strophiole resembles so much frost. Drawing was made soon after the seed was removed from the capsule, and it was noticed that after the seeds had been removed for several days, the little gorged cells lost their moisture and became dry. The strophiole as a whole shrunk some, but retained nearly its former size, the color becoming a light brown.

Fig. 14 represents a full grown capsule, though not ripe. The seeds, which were just turning brown, may be seen as they grow in pairs, and these in rows along the four-crested placenta. This capsule, drawn actual size, was smaller than the average. At (s) may be seen the persistent style.

Fig. 1.—Piece torn from placenta of ovary from youngest flower bud.

Fig. 2.—Cross section of ovary from flower bud next older.

Fig. 3.—Individual ovule, same age as those of Fig. 2.

Fig. 4.—Individual ovule, at still higher stage of development.

Fig. 5.—Cross section of integuments of ovule from oldest flower bud.

Fig. 6.—Cross section of seed coats of seed from youngest capsule.

Fig. 7.—Cross section of seed coats of seed from older capsule.

Fig. 8.—Cross section of seed coats of seed from still older capsule.

Fig. 9.—Cross section of seed coats of seed from still older capsule.

Fig. 10.—Cross section of seed coats of seed from still older capsule.

Fig. 11.—Cross section of seed coats of nearly ripe seed.

Fig. 12.—Tangential view of layers corresponding in numbers to those of Figs. 10 and 11.

Fig. 13.—Nearly ripe seed in profile, drawn with magnification of a trifle over eight diameters.

Fig. 14.—Full grown capsule, though not ripe,
School of Pharmacy, University of Michigan, Ann Arbor, Mich.

THE COLOR COMPOUND OF *STYLOPHORUM DIIPHYLLUM* AND *CHELIDONIUM MAJUS*.

BY J. O. SCHLOTTERBECK.

The two plants *Stylophorum diphyllum* and *Chelidonium majus*, Family *Papaveraceæ*, are so closely related botanically that a cursory glance would scarcely distinguish them. In fact they are properly species of the same genus. A remarkable similarity in chemical constituents is also evident, since both plants contain the alkaloids chelidonine, protopine and sanguinarine, a yellow coloring matter of alkaloidal nature and chelidonic acid. The yellow coloring matter was first found in *Chelidonium* by Probst, and given the descriptive name chelidoxanthin. In a paper* entitled, "Contribution to the Chemistry of *Stylophorum Diphyllum*," the statement was made that a yellow color body was separated which from

* Proc. A. Ph. A., 49, 251.

analogy was believed to be identical with the chelidoxanthin of Probst. The properties of chelidoxanthin are described by Probst as follows: Short yellow needles, very difficultly soluble in cold water, more easily soluble in hot water, more soluble in dilute alcohol than strong alcohol, and insoluble in ether. Extremely bitter, solutions intensely yellow, one part coloring over 1,000 parts water yellow. Acids and alkalies do not alter the color materially, concentrated sulphuric acid dissolves it easily with evolution of gas. The water solution is precipitated with tincture of nutgalls.

Chelidoxanthin was originally separated from both fresh and dried materials as follows: The drug was extracted with water containing a little sulphuric acid for the purpose of removing alkaloids. The dregs were then exhausted with hot water or until the percolate was no longer yellow. To the concentrated aqueous extract lead acetate solution was added until no further precipitate was formed, and then filtered. To the filtrate more lead acetate was added, and the lead decomposed with hydrogen sulphide. The lead sulphide was washed with cold water until the filtrate became colorless and did not possess a bitter taste. Then the sulphide precipitate was boiled repeatedly with water until it was exhausted of yellow color. The combined filtrates were evaporated to dryness, digested with ammonia, then with ether and lastly with dilute alcohol, from which the compound crystallized in crusts.

A very small amount of a yellow color body was obtained from *Stylophorum diphyllum* by a slight modification of the above method. Qualitative tests made with this substance led the writer to believe in the presence of berberine instead of a new principle. The amount at hand, however, was too small to warrant positive statements. In order to more fully study this interesting substance, about eighty pounds of the dried root of *Stylophorum diphyllum* was extracted by the ammonia-chloroform method, which consists in moistening the dried drug with ammonia water for the purpose of releasing the alkaloids from their natural combinations in the plant, drying at room temperature, and then exhausting with chloroform. The white alkaloids are very soluble in chloroform while the yellow coloring matter is only slightly soluble. The chloroform continued to slowly dissolve the yellow coloring matter even after all of the white alkaloids had been removed. After the chloroformic extract had been removed from the receiver, it was noticed that a thin coating of brownish-yellow color had accumulated on the wall of the vessel. A little was removed with a spatula and boiled with water, the latter becoming yellow. Dilute nitric acid almost completely precipitated the yellow coloring matter in the form of fine needles. Potassium iodide precipitated the color so completely that the supernatant liquid was absolutely without color. This reaction pointed to the existence of a salt of some base in which the acid transposed with the hydriodic acid of the potassium iodide.

Gordin has shown that berberine breaks up chloroform with the formation of hydrochloric acid, the latter uniting to form the hydrochloride of berberine. The same is true with this color compound, for when the aqueous solution was treated with nitric acid and to the almost colorless filtrate silver nitrate added, a white precipitate formed which readily dissolved in ammonia water. Enough distilled water was now poured into the receiver to completely cover the coating and heated for several hours, and the liquid then filtered. The yellow solution of the hydrochloride was precipitated with dilute nitric acid, the precipitate collected on a filter and thoroughly washed with water. It was then dissolved in hot 75 per cent. alcohol, slightly cooled and dilute sulphuric acid added in excess. Two volumes of ether were added, the whole shaken and set aside for several hours. Fine needles of the sulphate formed in considerable abundance. By purifying several times the color of the sulphate, as well as the hydrochloride and hydriodide, was practically the same as the corresponding salts of berberine.

The quantity of substance so obtained, though considerable, was but a small percentage of that existing in the drug. The remainder was obtained as follows: The dreg remaining after extracting with chloroform was exhausted with boiling water, the percolate reduced to small volume and then treated with a large excess of strong alcohol. This removed a large amount of extraneous matter in the form of a stiff, pasty dark-colored mass. The supernatant alcoholic liquid was filtered and reduced to small volume in vacuo. Upon standing a considerable amount of impure reddish-yellow crystals separated. A still further quantity could be thrown out by means of nitric acid or potassium iodide, but these portions were rather impure and required several recrystallizations.

This color compound was dissolved in boiling water, filtered, and portions converted into the sulphate, hydriodide, hydrochloride, nitrate, and into the acetone compound. The salts of this color compound, which behaves like an alkaloid, crystallize in fine needles of different shades of yellow. They are all quite insoluble in cold water. Hot water dissolves them easily, only to throw them out again in crystalline form upon cooling. Aqueous solutions are turned blood red in color with strong chlorine water. The solutions are very bitter, and are possessed of an intensely yellow color.

In color, taste, solubilities, and qualitative tests, this color compound agrees with the alkaloid berberine. Ordinarily the identification would be complete, but since Gadamer has found colored alkaloids in the *Papaveraceæ*, which are very similar to berberine in their behavior, it was necessary to be able to make the iridescent scales of the acetone compound to be absolutely certain that we had berberine. This was easily made in quantity from each of the four salts mentioned above, and then reconverted into the hydrochloride.

The color compound of *Stylophorum diphyllum* before purification agrees with the description of chelidoxanthin of *Chelidonium majus*. It agrees with the color compound which was separated from fresh plants grown for the purpose. Therefore the writer believes that berberine should be added to the list of alkaloids found in these two plants, and the name chelidoxanthin dropped.

School of Pharmacy, University of Michigan, Ann Arbor, Mich.

Mr. Schlotterbeck then presented in abstract the paper by Mr. A. R. Cushny, on hyoscyamine and atropine, the text of the paper being as follows :

PRELIMINARY NOTE ON THE ACTION OF HYOSCYAMINE AND ATROPINE.

BY ARTHUR R. CUSHNY, M. D.

A very pure specimen of hyoscyamine, prepared from *scopola*, was given me by Dr. Schlotterbeck some time ago, and he had afterwards the kindness to prepare me pure atropine from belladonna to permit of a comparison of the pharmacological action of the two. The hyoscyamine proved to have a specific rotation of -21.8° , while the atropine was devoid of rotatory power.

I have compared the action of these two alkaloids on the terminations of the secretory nerve (*chorda tympani*) in the salivary gland of the dog and find that hyoscyamine has practically twice the paralyzing effect of atropine. The effect on the pupil was examined by the hypodermic injection of the alkaloids in the cat, as it is impossible to draw any conclusions as to the quantity which is active when the drug is dropped in the conjunctiva. The smallest amount of atropine which caused any dilation of the pupil in the cat I employed was 0.04 Mg. The corresponding amount of hyoscyamine was 0.02 Mg.

The effect of the two was next compared in paralyzing the inhibitory terminations in the heart of the cat. In the animal used, 0.12 Mg. of atropine was found necessary, while 0.06 Mg. of hyoscyamine had the same effect.

In comparing the effects of atropine and hyoscyamine on the frog, it was found that each paralyzes the terminations of the nerves in the striated muscles like curara, but not so powerfully. Atropine acts more strongly on the muscle plates than hyoscyamine and its effects last much longer.

As regards the effects on the central nervous system of the frog, atropine induces a marked increase in the reflex irritability, but only when considerable doses, *e. g.*, 20 Mg., are given. I could not satisfy myself that there was any such increase after 10 Mg. in a frog of medium size. Hyoscyamine causes no such increase in reflex irritability. In fact I am not quite certain that it has any central action whatever, but am carrying on experiments on this subject at present. I propose further to examine the relative

toxicity in mammals and to compare the action on the central nervous system in these.

Ann Arbor, September, 1902.

THE CHAIRMAN: You have heard the abstract of the three papers last presented. What will you do with them?

Mr. Bartley moved to receive and refer for publication, and it was so ordered.

THE CHAIRMAN: We have a number of papers here to be read by title only and referred, and I will read the list now and we can receive them altogether.

The chair then read the list and presented the following papers for the action of the Section:

Organized Water as a Food; by John Uri Lloyd.

The Alkaloids of *Eschscholtzia Californica*; by Richard Fischer.

The Alkaloids of *Dicentra Cucullaria*; by Richard Fischer.

The Presence of Arsenic in Chemicals; by Lyman F. Kebler.

Examination of Milk; by Maybelle Haydock.

Mr. Mayo, seconded by Mr. Good, moved to accept the several papers and refer for publication, and it was so ordered.

The chair then called on Mr. M. I. Wilbert to present in abstract his paper on Standardizing Dose Measures, which the author did, exhibiting some graduates and spoons of approved pattern to illustrate his subject.

On motion of Mr. Lyons, the paper was ordered received and referred for publication.

The full text of the paper was as follows:

STANDARDIZING DOSE MEASURES.

M. I. WILBERT,

Apothecary at the German Hospital, Philadelphia.

If we take a survey of the various ways and means at our command for administering the different medicinal substances, it will probably occur to us that liquid preparations have always been regarded with favor, by both the medical profession as well as the laity. The reasons for this are self-evident when we remember that the assimilation of pills, capsules, cachets and even loose powders depends largely on the ability of the stomach to disintegrate them and then dissolve out or absorb the medicinal ingredients they are supposed to contain.

While it must be admitted that these solid preparations usually facilitate the accurate administration of the desired dose, it must also be borne in mind that the dose as administered does not necessarily represent the amount of medicine that will be assimilated or absorbed.

It will not be necessary for us to go into details as to the why and wherefore of this discrepancy, for every one of you has had a number of cases

brought to your attention where pills or other solid preparations have passed through the gastro-intestinal tract without being disintegrated or even attacked in any way. It is well known that in cases where the general vitality is low, or where, from other causes, the natural functions of the gastro-intestinal tract have been markedly interfered with, solid preparations may even act as disturbing foreign bodies, and in this way cause considerable harm.

Liquid medicines, on the other hand, when properly diluted, so as to avoid any possible local injury, do not admit of any controversy as to their efficacy.

If we admit then that fluid preparations of medicinal substances are the more desirable, because they are necessarily the most active and reliable, it would appear to be more than passing strange that so little attention has been paid to the amount or quantity of these medicinal preparations that is usually measured out for the prescribed dose.

That these doses may vary, has been repeatedly suggested ; little or no attention, however, has been paid to the possible extent of this variation, or to a demonstration of its source or origin.

Before going further, it might properly be asked, why the pharmacist should be interested in the amount of a liquid medicine that a patient is likely to measure out for a dose? Is he not doing his duty if he dispenses preparations that he knows are reliable, and made according to the directions of the prescribed standards? What need it matter to him if a patient take a heaping spoonful or but a fraction of that quantity, where one spoonful was directed? In answer to this, we might say that it matters very materially and in a number of ways. Looking at the question from a purely utilitarian standpoint, the holding, or increasing the number of his customers, or the acquisition of dollars and cents, it will be found that a considerable amount of harm may come to him by practices of this kind. For instance, Dr. A prescribes a quantity of "Elixir Rhamni Purshiani N. F." for patient No. 1. This patient takes the prescription to somebody else's drug store, and being of a liberal turn of mind and a firm believer in the efficacy of medicinal preparations, he takes a heaping teaspoonful and in this way secures prompt and efficient results ; in the course of a few days he reports to the physician, who in turn advises him to continue the medicine if necessary. About this time the doctor has occasion to write this same prescription for another patient, who has the same filled at your store ; this second patient being of a cautious nature, only takes about half a teaspoonful at a dose, and, as might have been expected, with little or no satisfactory results. In the course of a few days or a week this patient also goes to the doctor to report. The medicine not having had the desired results, what is more natural than for the physician to inquire where the prescription had been filled, and, remembering that the medicine from which he had secured such prompt and satisfactory results had been dis-

pensed at somebody-else's drug store, he naturally advises patient number two to get the second prescription filled there, at the same time directing him that in case the desired results are not promptly obtained, to increase the dose. This latter instruction is usually obeyed, and the medicine, as obtained from somebody-else's drug store, being taken in sufficient quantity proves to be efficient; consequently both the patient as well as the physician are probably satisfied that somebody-else's preparations are more efficient than yours. This illustrates but one of the reasons why the pharmacist is, or should be, interested in the amount of a medicine that may be measured out for a prescribed dose.

A much more important reason, from a professional point of view, is evident when we consider the amount of scientific work that has been done by the pharmacist and pharmaceutical chemist, in the matter of standardizing different preparations of the vegetable *materia medica*.

The files of pharmaceutical journals, as well as the proceedings of pharmaceutical associations, are filled with proposed methods of assay for standardizing one or the other of the different galenical preparations. When we consider the amount of time, work and money that will necessarily be consumed in complying with even a limited number of these proposed methods of assay, providing of course they are incorporated in the coming edition of the Pharmacopœia, and compare the possible variation, in alkaloidal strength, of any galenical preparation, with the probable variation in the size of the dose, as measured out by or for a patient, it will probably appeal to us that here is an opportunity for an immense amount of money, time and energy going to waste.

In a series of experiments that were made by the writer, and subsequently reported in the American Journal of Pharmacy (1902, page 120), it was shown that the average teaspoonful dose, as measured with the same spoon by different people, varied from 3 to 7 cubic centimeters: it will be noted that the highest quantity here is just two and one-third that of the lowest. It is doubtful indeed if any compound tincture of cinchona, for instance, carefully made from selected bark, would or could vary to the same degree. What is of more importance, however, is the fact that the medicine glasses in use at the present time are far from being the accurate and reliable dose measures that they are reputed to be. Not only do they vary considerably at the different graduations, but the majority of them are so constructed that it is practically impossible to measure small quantities with any degree of accuracy. The actual capacity of a number of these graduated measures was found to vary from 2.6 to 6.4 cubic centimeters at the teaspoonful mark. The practical variation, however, that is, the variation that was found to exist by having doses measured out by different individuals, was even greater. Using measures that were graduated correctly, it was found that the doses as measured ranged from 1.5 to 6 cubic centimeters for teaspoonful quantities. It should be remembered that this

is not taking into account the possible variation that might result if we included the abnormal or inaccurately-graduated measures.

This marked discrepancy in glass medicine measures may appear unusual or exceptional ; it is easily verified, however, by testing the glasses in your own stock. One precaution, however, is necessary, and that is to avoid, as much as possible, any suggestive influences ; for this reason do not test your glasses by measuring into them a certain quantity of liquid, but use them, as they are intended to be used at the bedside of a patient, as measures, to measure out the required medicine or liquid into an ordinary tumbler. After measuring out ten separate doses, weigh or measure the total amount so obtained and note the average. Then if you will get your assistant, or a customer, to do the same, and note the difference, you will probably be surprised at the possible variation. The resulting figures will certainly be an object-lesson in demonstrating that small quantities of a liquid cannot be safely or accurately measured by means of the ordinary wide medicine-glasses.

In these few notes we cannot expect to do more than call your attention to the possible errors that might be caused either by the inaccuracy of the medicine-measures themselves, or by the fact that these measures are but poorly adapted for accurately measuring liquids in small quantities. Our object in doing this is to have you, if possible, endorse the resolutions that were adopted at a recent pharmaceutical meeting of the Philadelphia College of Pharmacy. Briefly, the points of these resolutions are as follows :

1. The use of properly made and accurately graduated glass dose-measures is to be commended. These measures, however, are to be so constructed that the height of the contained liquid at a spoonful mark is greater than its diameter.

2. That where spoons are used as medicine-measures, the application of the French Codex definition of a spoonful be recommended. This definition reads as follows: A spoon is full when the contained liquid comes up to, but does not show a curve above the upper edge or rim of the bowl.

3. That in connection with the use of the metric system of weights and measures, the following equivalents be recommended: One teaspoonful equals 5 Cc. ; one dessertspoonful equals two teaspoonfuls, or 10 Cc. ; one tablespoonful equals three teaspoonfuls, or 15 Cc.

Either one of these three points is of vital importance in connection with the preparation, dispensing and administration of liquid medicines.

The first point should hardly require argument, especially when we consider the usual shape of glass medicine-measures, their diameter at the base, and the point at which the teaspoonful mark must necessarily be placed. In glasses of this kind a very slight variation of the graduating mark, or a difference of opinion as to the point from which the resulting meniscus is to be read would vary the amount of the contained liquid very

materially. This defect could be overcome to a very considerable degree if the column of the contained liquid were higher and not so wide.

The second point is of importance from the fact that we cannot, by any means at our command, avoid the use of spoons as medicine measures. If spoons must be used, it would appear quite proper that we attempt to secure at least a reasonable degree of uniformity in the amount that is to be measured by using them.

The third point is of growing importance, and should be definitely fixed at as early a date as possible, and in such an authoritative way that the decision will be generally acceptable to both the medical as well as pharmaceutical professions. At the present time there is no generally accepted equivalent for tea, dessert and tablespoonful in the metric system. If, for instance, a physician writes "5 Cc. t. i. d." as the directions accompanying a prescription, the pharmacist will probably transcribe this as "One and one-fourth teaspoonful three times a day;" certainly not a practical quantity to measure out.

The equivalents enumerated above have been proposed, because they are metric quantities, and also because they represent very nearly the actual capacities of the different spoons as used at the present time.

There is one more point that we would like to call your attention to, and that is the difference that exists in the size of the drops. Of late years there appears to have been a tendency to produce a class of fluid preparations, in some cases standardized by chemical and even physiological means, and so concentrated that they are to be measured out in drop quantities.

Investigations that have been made with a view of determining the variation in the size of drops would appear to indicate that as medicine measures, drops are not to be relied on. Their relative size depends on so many different factors that at the present time at least it would appear impracticable to even suggest any possible means or methods for securing correlating results. What we can do, however, is to make an effort at introducing more reliable devices or accurate methods for measuring the smaller quantities at the bedside of the patient, or by the patient himself, with a view primarily of increasing our knowledge as to the action of certain medicines on the human organism, and also to reduce to a minimum, if possible, any danger of producing any unwished-for or undesirable secondary effects of the medicine on the patient. Then, too, if pharmacy is to be a highly specialized and purely scientific profession, it would appear as though accuracy in the administration of doses could hardly be made secondary to complicated chemical or physiological methods for standardizing the different medicinal preparations.

In connection with his paper, Mr. Wilbert offered the following resolutions:

RESOLUTIONS IN REGARD TO ACCURACY IN MEASURING AND ADMINISTERING MEDICINES.

WHEREAS, The accurate measuring out and administration of doses of liquid medicines is a matter of great scientific as well as practical importance, therefore, be it

Resolved, That the Scientific Section of the A. Ph. A. recommend that, the Association in general meeting endorse the set of resolutions adopted at a pharmaceutical meeting held at the Philadelphia College of Pharmacy, Tuesday, April 15, 1902:

WHEREAS, It is desirable to secure greater accuracy and more uniformity in the measuring out or administration of doses of liquid medicines: therefore, be it

Resolved, That we, members of the Philadelphia College of Pharmacy, assembled at this pharmaceutical meeting, recommend the use of accurately graduated glass dose measures; these measures to be constructed so that the height of the contained liquid, at a spoonful mark, is greater than its diameter.

Resolved, That for use in connection with spoons as dose measures, we recommend the promulgation of the following definition taken from the French Codex:

"A spoon is full when the liquid it contains comes up to, but does not show a curve above, the upper edge or rim of the bowl."

Resolved, That for use in connection with the metric system of weights and measures, we recommend the adoption of the following approximate equivalents of spoonfuls:

1 teaspoonful equals 5 Cc.

1 dessertspoonful equals 2 teaspoonfuls or 10 Cc.

1 tablespoonful equals 3 teaspoonfuls or 15 Cc.

Mr. Hallberg, seconded by Mr. Mayo, moved the adoption of these resolutions.

MR. LYONS: As I understand, the resolutions just offered are in regard to three different points. Individually, I should favor the first and third of these points, but as to the second I should discourage absolutely the use of the spoon as a measure for medicine. They will be used, but we should, if possible, try to get rid of them.

MR. MAYO: Mr. Lyons himself confesses that people will use spoons, and the resolution endeavors to fix some uniform rule or guide in their use. The idea of Mr. Lyons to condemn the use of spoons is a different matter.

The motion to adopt the resolutions offered by Mr. Wilbert was carried.

MR. HALLBERG: Now, Mr. Chairman, I have been following up this same subject on almost identical lines with Mr. Wilbert, and had a paper containing practically the same suggestions presented to the Section on Materia Medica, Pharmacy and Therapeutics of the American Medical Association last June. The physicians in attendance seemed to favor the proposition, and they appointed a committee of three to report at the next meeting of the Association in New Orleans next June. The committee consists of Dr. H. C. Wood, Jr., Dr. Woodbury and Dr. Eshner, the three most prominent physicians, perhaps, of the Philadelphia County Medical Society. So it seems we have things pretty well concentrated on this proposition; and I hope the Philadelphia College and the Philadelphia pharmacists will co-operate with the Philadelphia County Medical Society, so that we may have a good report from the committee next year; and in order to clinch the matter, I would like to have these resolutions referred to the American Medical Association also.

Mr. Kremers seconded the motion, and it prevailed.

THE CHAIRMAN: We will now listen to Mr. Henry Kraemer on the subject of microscopical examination of commercial starches.

Mr. Kraemer gave an abstract of the paper, eliciting the applause of his audience. The paper in full was as follows :

SOME NEW METHODS IN THE MICROSCOPICAL STUDY OF THE
COMMERCIAL STARCHES.

BY HENRY KRAEMER.

Some of the most interesting problems in pharmacognosy are those connected not so much with the general study of the structure of drugs, as the special study of particular cells with regard to the structure of the wall or their contents. My researches on the structure of the starch grain offer some results which it seems to me are worthy of a practical consideration in connection with the microscopical examination of the commercial starches. The research work as it relates to the scientific aspect of this subject will be published elsewhere shortly, although some phases of it have already been treated in other papers published by the author.*

It is the application of these results that the author desires to consider at this time. (1) On the treatment of the starches with chromic acid and other reagents certain distinctive and characteristic changes in the structure of the grains are brought about. There is the development of a crystalline-like structure, a central cleft or fissure and finally a rupture or disintegration of the grain, all of which serve to differentiate the typical potato, wheat and corn starch grains. (2) The use of stains, as gentian violet and safranin, shows that there are distinct areas which hold the stain, except in corn starch.

In working with other stains it was observed that a solution of fuchsin was decolorized on the addition of corn starch. This was at first thought to be due to a peculiarity of this starch, but it is apparently due to the traces of alkali contained in the commercial product as a result of its purification with alkalies. The question arises in this connection as to whether corn starch is the most desirable for pharmaceutical purposes and should be recognized as the official starch.

The chair stated that, without objection, the reception of all papers presented now would be deferred until the list was complete.

THE CHAIRMAN: I would like to say, with reference to the paper just read, that I have done quite a little work along the line of determining the amount of alkalinity in corn-starch.

Mr. A. B. Prescott, on behalf of the Council, was then given the privilege to make an announcement to the effect that the report of the special committee appointed to consider the establishment of a drug journal had been made to the Council and been considered by that body very earn-

* Journal of American Chemical Society, 1899, p. 650. Also American Journal of Pharmacy, 1899, p. 174. Also Proc. Amer. Philos. Soc., Vol. XII, No. 169 (1902), p. 175.

estly for the past two hours, when a motion to adopt the majority report of the committee was substituted by a motion to continue the discussion upon this important matter, and the chairman was requested to invite any members of the Association who desired to speak to attend the meeting of the Council to-morrow morning at 9 o'clock, when brief remarks would be in order. He said it was not contemplated that any action which might be taken would go into immediate effect.

Mr. Lyons being called upon, then presented in brief abstract the following paper :

**RELATIVE STRENGTH OF THE VARIOUS PREPARATIONS OF DIGITALIS
AND KINDRED DRUGS AS SHOWN BY EXPERIMENTS ON FROGS.**

BY L. W. FAMULENER AND A. B. LYONS.

A satisfactory method of determining the strength of preparations of digitalis by chemical assay remains yet to be devised. Determination of digitoxin, as recommended by Keller, may give an approximate measure of the activity of the crude drug, but digitoxin is not its only active constituent, and the relative proportion in which these various constituents exist in different preparations of digitalis must vary greatly. The experiments of J. P. Arnold and H. C. Wood, Jr.,* have shown that the action of digitalin (Merck) differs from that of digitoxin (Merck) in degree but not in character. The latter they found to be about 4.7 times as active as the former ; their experiments having been made upon mammalian animals. The practicability of obtaining quantitative results sufficiently exact for practical purposes is shown by the experiments alluded to.

The question arises whether results may not be reached by experiments of a simpler kind upon animals of a lower organization, which will serve almost as useful a purpose. The present series of experiments has been undertaken as a contribution towards the solution of that question. The first thing to ascertain was whether, under similar conditions, the action of the same drug upon animals of the same species was quantitatively identical. To determine this question, varying doses of digitalin (German) were administered to frogs of known weight until a minimum amount was found which would just cause paralysis of the heart's action in one hour. It was found that such a minimum could be determined with fair precision.

The *modus operandi* of making the test is as follows : A healthy frog of approximately standard weight (the standard adopted being 40 grams) is selected and carefully weighed. An exactly measured portion of the solution to be tested is administered by the aid of a pipette terminating in a slender point, the floor of the mouth under the tongue being punctured and the contents of the pipette delivered directly into the anterior lymph sac of the animal. Care must be taken that the solvent be in all cases of

* American Journal of the Medical Sciences, August, 1900.

the same alcoholic strength, a certain amount of alcohol being necessary in many cases to effect solution of the substance injected.

Under the influence of digitalis and other drugs having a similar action, the frog's heart becomes first lower in rhythm, the systolic action is increased and prolonged, while the diastolic action is diminished and becomes shorter in duration, the ventricle being the part thus affected. As the action of the drug continues the apex does not take part in the diastole of the ventricle, but remains in a contracted condition. This state of extreme systolic action is increased until it extends to the auriculo-ventricular septum, the cavity is obliterated and absolute paralysis of the ventricle ensues. The auricles which have thus far continued to pulsate become now greatly distended with blood, and, not being able to empty themselves, these also finally come to a standstill.

At the end of one hour the thorax of the frog that has received the dose is laid open so as to expose the heart. If this is already completely paralyzed the dose has been excessive; if pulsation still continues, although at a diminished rate, the dose has been insufficient. When the dose has been the minimum to produce paralysis in one hour, we shall find the following typical condition: the apex of the ventricle is paralyzed but at the base (region of the auriculo-ventricular system) there is occasionally a very faint wave of contraction, indicated only by a color wave which is noticed quite commonly to have its origin at the left base of the ventricle, passing thence across the ventricle, while the auricles are much distended but continue to pulsate regularly. This we have taken as our end reaction, and in the experiments here recorded the minimum amount of drug which will produce this condition in sixty minutes in a forty gram frog, we designate "minimum dose." If the weight of the frog used in the experiment is more or less than forty grams, the quantity actually used must be calculated to "standard weight of frog," a simple problem in the familiar "rule of three."

It has been necessary probably to sacrifice six to ten frogs to reach this result, and about four more will be needed to fully substantiate the determination. We cannot expect to find our frogs exactly identical in susceptibility, but we may be sure that they will show far less variability than warm-blooded animals. As a matter of fact, out of a dozen seemingly healthy frogs, not more than one or two will show a variation of as much as ten per cent. above or below the average susceptibility.

The results of numerous tests of German digitalin (Merck's) showed that 0.9 milligram was the average "minimum dose." Four or five different series of experiments have given identically the same result.

It may be expected that at different seasons, and under different conditions, a somewhat different figure might be found. To guard against the possibility that the frogs used in any particular series of experiments might be below or above the average susceptibility, it is advisable always

to test this question by giving to one of the frogs the "minimum dose" fixed by former experiments, to another 10 per cent. more and to a third 10 per cent. less than that dose. If the result of this experiment showed any deviation from normal susceptibility it would be necessary to fix a new minimum for these particular frogs, and correct our other tests accordingly. Thus, if we found the new minimum to be 0.8 instead of 0.9 milligram, all results obtained with these frogs would have to be increased by one-eighth to bring them to the ordinary standard.

As a matter of fact, we have not thus far found any great variation in susceptibility in the frogs used in our experiments, except in some cases where the animals were obviously not in a healthy condition. Results of experiments repeated on the same sample of drug have been even more closely concordant than results of chemical assay of such vegetable drugs as opium and *nux vomica*.

We have examined four or five different samples of German digitalin, one bearing the label of Malincrodt, the other that of E. Merck, some of them recently purchased, some known to be at least two years old. In all but one the "minimum dose" was 0.9 milligram. In the exceptional one, which was an old sample by the way, it was 0.8 milligram.

TESTS OF THE SEVERAL ACTIVE PRINCIPLES (COMMERCIAL) OF DIGITALIS.

Having demonstrated the possibility of obtaining satisfactory quantitative results by the method above described, we proceeded to test thus the several products offered by manufacturers as the active principles of digitalis. We applied to these the tests described by Keller and by Kiliani with results that will be stated hereinafter. The reactions of the pure active principles as given by Keller are as follows:

1. Digitoxin—If the pure glucoside is dissolved in glacial acetic acid containing iron chloride and concentrated sulphuric acid is allowed to form an underlying stratum, a dark zone forms after a few moments at the plane of contact, while the acetic acid is colored a rich indigo blue.
2. Digitonin—Concentrated sulphuric acid colors the glucoside first yellow, then brownish-red, dissolving it finally to form a red solution.
3. Digitalin—Concentrated sulphuric acid colors the glucoside intensely yellow, dissolving it soon to form a beautiful cherry-red or blood-red solution.

Kiliani states the reactions as follows: 1st Digitoxin—(A) If the glucoside is dissolved in acetic acid containing a trace of ferric sulphate, and the solution underlaid with sulphuric acid containing also a trace (0.01 per cent.) of ferric sulphate, a blue color is gradually developed in the acetic acid, while the sulphuric acid remains colorless. If digitalin is present the sulphuric acid becomes reddish-violet, and the acetic acid indigo blue. (B) Sulphuric acid containing a trace of ferric sulphate (as above) produces with digitoxin a dark color, forming finally a dirty brownish-red solution.

2d Digitalinum verum. Sulphuric acid containing ferric sulphate is colored by the glucoside a deep golden yellow, rapidly changing to a permanent reddish-violet.

Using in our experiments samples of the several active principles named obtained from Merck, we obtained the following results :

DIGITALIN, GERMAN.

This is practically the only digitalin known in this country. It is a yellowish-white, amorphous powder, readily soluble in water, forming an intensely bitter solution which froths strongly when shaken. Kiliani's reagent (sulphuric acid with a trace of ferric sulphate) produces a yellow color changing to a deep red, slightly brown. With acetic acid and the above reagent, it gives no reaction for digitoxin. The sulphuric acid becomes pink, then cherry-red, while the acetic acid is colored slightly yellow.

Pharmacological experiments made by several independent observers have confirmed the clinical evidences that this preparation produces the characteristic effects of digitalis. It is stated that the drug yields three or four per cent. of this product. Besides this it contains something like 0.25 per cent. of the more active digitoxin. We should infer from this that this digitalin is probably not more than thirty times as active as digitalis itself. The experiments of Arnold and Wood upon dogs seemed to show that it is only about ten times as toxic as the crude drug, and these authors would regard 15 milligrams ($\frac{1}{4}$ grain) as the equivalent of an ordinary dose of digitalis. The majority of prescribers are content with much smaller doses, but they are very possibly too timid in prescribing, trusting the statements of authorities rather than their own observation.

Our own experiments on frogs indicate that digitalin is really thirty times as "strong" as digitalis. Of course the frog is not so nearly related to man as the dog, and our conclusions may be consequently further from the truth than those of Arnold and Wood ; the question must be decided by observations on the human subject.

Meanwhile German digitalin remains the best concentrated representative we have of this drug. It is remarkably constant in activity, is readily soluble in water and so is well suited for hypodermatic use. Our experiments indicate that one-eighth of a grain of this product is the equivalent of a tablespoonful of infusion of digitalis, which may be considered an ordinary full dose of the remedy. Heretofore the ordinary single medicinal dose of this active principle has been stated to be from one to two milligrams—maximum four milligrams, although Dr. Beates, in 1897, declared that it might be given with good effects in doses of thirty milligrams, a statement quite consistent with our own results.

DIGITALIN, "FRENCH."

French digitalin, the digitalin of the French and Belgian Pharmacopœias, also known as Homolle's amorphous digitalin, is a somewhat more active preparation than the foregoing. It is a yellowish amorphous powder, intensely bitter, soluble readily in alcohol and in chloroform, but only sparingly in water. With Kiliani's sulphuric acid reagent it produces a very dark-brown coloration. With Kiliani's test for digitoxin it gives a green color in the upper stratum, resulting probably from a combination of the blue of digitoxin with the yellow of digitalin. It is no doubt a mixed product, and may prove to be consequently variable in strength.

Our experiments show that it is more active than German digitalin in the ratio of about two to three. Its insolubility interferes with its use hypodermatically, and in our experiments it appeared to have a depressing action, which if it is experienced also by the human subject would be a serious objection. The full dose deduced from our experiments would be 5.3 milligrams (about one-fourteenth of a grain). It is ordinarily stated that the dose of French digitalin is from one-fourth to one-half a milligram, 15 milligrams being a maximum in 24 hours.

DIGITOXIN.

This is conceded to be the most active constituent of digitalis. It is indeed one of the most powerful of vegetable poisons, one-thirtieth of a grain of it having produced in an adult most alarming symptoms. The commercial product (Merck) is a pure white crystalline substance, only slightly bitter in taste when placed upon the tongue. Its alcoholic solution, however, is strongly bitter. It is practically insoluble in water, but dissolves in chloroform and similar solvents.

Kiliani's sulphuric acid reagent turns the crystals a very dark brown. With acetic acid and the foregoing it gives the reaction already described as characteristic of this glucoside, although it shows by the coloration of the sulphuric acid contamination with Kiliani's "digitalinum verum." Its cost, as well as its insolubility in water and its extremely irritating character prohibit its medicinal use. Arnold and Wood found it about seventy times as toxic to dogs as digitalis itself. From this they would deduce a probable medicinal dose of about 2.3 milligrams, but clinical experience places the useful dose much lower— $\frac{1}{4}$ to $\frac{1}{2}$ milligram.

Our own experiments would indicate that commercial digitoxin—the same probably as that used by Arnold and Wood—is about three times as active as German digitalin, so that a full dose would be about three milligrams. It is probable that this result is fallacious, owing to the slowness of absorption of the glucoside in the experiments on frogs. It is likely also that the strength of the French digitalin is also underestimated in our mode of testing from the same cause. On the other hand, the relative strength of the very soluble German digitalin may very possibly be over-

estimated in this mode of testing. However this may be, the method would remain a trustworthy one for the purpose for which it was devised, viz., the comparison of different galenical preparations of the same drug, in which it may be assumed that the active principles are present in the same relative proportions, and do not vary greatly in solubility in the several preparations.

DIGITALEIN.

An amorphous, yellowish-white powder, readily soluble in water and of an intensely bitter taste. It is not in practical use medicinally and may be regarded as an impure form of digitalin, although believed by Schmiedeberg, who first prepared it, to be a definite chemical substance. Kiliani's sulphuric acid reagent causes it to become first yellow, rapidly changing to pink, and finally to reddish-brown. When tested for digitoxin by Kiliani's method, a bright cherry-red zone is produced at the plane of contact of the two fluids.

In activity, as shown by experiments with frogs, it is considerably inferior to German digitalin, a full dose of the sample tested being presumably about one-sixth grain.

DIGITONIN.

A light yellow, crystalline substance having a bitter taste. Kiliani's sulphuric acid reagent produced first a yellow color which rapidly changed to red and finally to a dark reddish-brown. These results agree with the statements of Keller. Kiliani says that the reagent produces no color with digitonin. This is probably true when the digitonin is pure, the color reaction being very likely due to the presence of some digitalin. Kiliani's digitoxin test gave a zone of cherry-red at plane of contact of the acids, diffusing downward into the sulphuric acid while above a light yellow color is produced; later a red-brown zone was formed between the two acids.

A dose of ten milligrams in solution was given to a frog. At the end of an hour the heart was exposed and found to be beating regularly, although its action was somewhat weak. There was no contraction of the ventricle as in digitalis poisoning. The substance in fact is classed as a "saponin" and is not entitled to a place among the active principles of the drug.

DIGITIN.

This substance, which has been improperly called crystallized digitalin, is a pure white powder of a bitter, astringent, somewhat metallic taste. It is quite insoluble in water, but dissolves in alcohol, ether and in solutions of alkalies.

Kiliani's sulphuric acid reagent colors the powder a light yellow, changing to reddish-brown. In Kiliani's digitoxin test, a light brown zone develops along the plane of contact of the acids, diffusing downward into the sulphuric acid, while the acetic acid assumes a light yellow color. The substance is

said to be medicinally inert. Ten milligrams of it partially dissolved and suspended in diluted alcohol were injected into the lymph sac of a 50 gram frog. At the end of an hour and a half the heart was exposed and found to be in practically a normal condition.

GALENICAL PREPARATIONS OF DIGITALIS.

The assay of galenical preparations of digitalis by the experimental or pharmacological method is easily carried out. It is necessary to have a supply of healthy frogs, which should be as nearly as possible of uniform size. Those weighing about forty grams are the most suitable for these experiments. The frogs should be kept always under uniform conditions, and a sufficient number of experiments should be made to eliminate possible errors due to idiosyncracies in the subjects.

The preparation is to be brought into solution if in a solid state, and the solution is to be suitably diluted with a "normal" or "physiological" salt solution. A uniform quantity of 0.5 Cc. of fluid should be used in each experiment. If a large quantity is used the effects are not as rapidly produced, since absorption of fluids in these animals does not take place rapidly.

Three frogs are selected for the preliminary experiments. To one is given a dose which should be near the minimum to paralyze the heart in one hour; to the second 50 per cent more; to the third 50 per cent less. If the strength of the preparation is approximately known, the difference may be made only twenty-five or even ten per cent. On the other hand, if the strength is not so known, even larger differences in dose are advisable in these preliminary experiments. The results of these tests will usually give a pretty close approximation to the value sought, and a second series of experiments, with narrower limits of variation in dose, will generally prepare the way for the final tests which, indeed, are commonly but duplicates of those just made.

FLUID EXTRACT OF DIGITALIS.

The "minimum dose" of a good fluid extract of digitalis is not more than 0.04 Cc. Theoretically, it ought to be considerably less, probably about 0.03. In commercial fluid extracts we have found its range from 0.025 to 0.05, or in some cases when the alcoholic strength was low and the preparation old, considerably higher than the latter figure. The drug is not thoroughly exhausted in ordinary processes of manufacture, and deterioration may possibly take place in the product after it is made, although, where the official menstruum is used, we have not found such change to occur.

TINCTURE OF DIGITALIS.

It is easy to make a tincture of digitalis of standard strength. We do not find that the preparation is liable to deteriorate with age when the

menstruum is of official alcoholic strength. The "maximum dose" for a good tincture of digitalis we have found to be about 0.18 Cc. This corresponds with a "minimum dose" in the drug of 0.027, which is an average of what we have found in samples thus far examined.

TINCTURE OF DIGITALIS—FAT FREE.

Whether a tincture made from digitalis freed from fatty substances is, as has been claimed, devoid of tendency to cause gastric irritation, nausea, etc., we cannot undertake to say. We have had the curiosity at least to test the activity of such preparation as compared with that of a tincture made by the official process. The result of the experiment showed that in their action on a frog's heart the two preparations are identical.

EXTRACT OF DIGITALIS.

A hydro-alcoholic extract of digitalis was made from assayed drug and submitted to "physiological" test. It proved to represent fully the activity of the drug from which it was made, its "minimum dose" being 6 milligrams against 27 for the drug.

INFUSION OF DIGITALIS.

A single experiment only was made, which indicated that the preparation corresponded closely in activity with a tincture representing the same quantity of the same sample of drug. It has been believed by many physicians that the infusion is a more efficient preparation than the tincture, but the difference has no doubt been due to the fact that much larger doses of digitalis have been represented in the doses prescribed of the infusion than in those of the tincture. About 0.8 Cc. proved to be a "minimum dose" of the infusion prepared according to the United States Pharmacopœia.

THE CHEMICAL COMPARED WITH THE PHYSIOLOGICAL METHOD.

Three of the samples of fluid extract of digitalis that had been assayed by the physiological method were submitted also to a chemical assay by the method of Keller, which assumes that the relative strength of samples of the drug is proportioned to the amount of digitoxin present at the time that the experiments were made; both methods of assay were equally unfamiliar to the operator and the results cannot therefore be regarded as having any very high value. They seem to show, however, that the chemical method does not give very close duplicates, and that the results of the chemical assay probably do not indicate correctly the relative strength even of the samples assayed. Thus the chemical assay of the sample B shows fully 25 per cent. more digitoxin than that of "A," while, tested physiologically, "A" is more than ten per cent. stronger than "B." This is not surprising, in view of the experiments which show that digitalin as well as

digitoxin acts on the heart, the former being a more abundant constituent of the drug. The results of the experiments were as follows :

SAMPLE.	Chemical Assay.		Physiological Assay.	
	Crude Digitoxin per cent.	Purified Digitoxin per cent.	Minimum Dose for Standard Frog.	Per cent. Digitoxin indicated.*
A. duplicate.....	0.359	0.183	—	—
A.	0.350	0.208	—	—
A. average	0.355	0.196	0.026 c.c.	0.654
B.	0.492	0.266	—	—
B. duplicate.....	0.383	0.250	—	—
B. average.	0.438	0.258	0.029 c.c.	0.586
C.	0.292	0.175	—	—
C. duplicate.....	0.333	0.208	—	—
C. average	0.313	0.192	0.038 c.c.	0.447

* Assuming that one-half the toxic effect produced is due to digitoxin, the ratio of these figures would remain the same if we assumed the effect to be due to digitoxin only. It seems to us probable that less than one-fourth of the effect is actually due to digitoxin. It is to be regretted that we did not determine experimentally the activity of the crude and the purified digitoxin obtained in the chemical assay.

CARDIAC TONICS OTHER THAN DIGITALIS.

A final series of experiments was undertaken to test the comparative activity of the various drugs which act on a frog's heart as digitalis does. Full detail of the experiments need not be given. All were performed in precisely the same manner, and under conditions as nearly as possible identical. The results of these as well as of foregoing experiments have been tabulated to facilitate comparison. They show, as we should expect, that strophanthus is by far the most active drug of the series, its active principle exceedingly potent. That convallaria should stand next to strophanthus in activity is, however, a surprise. The order is strophanthus—far more active than any of the others—then convallaria flowers, and in succession, Canadian hemp, bitter root (*Apocynum androsæmifolium*), convallaria root and herb, hellebore, adonis vernalis, squill, digitalis, wahoo. Cactus grandiflora and Hawthorn berries, both used for their action on the heart, do not produce the characteristic effects of digitalis in experiments on frogs. In the tabular statement we have given hypothetical doses for each of these drugs, corresponding according to the results of our tests with a medicinal dose of digitalis. It is needless to say that these hypothetical doses show a wide divergence from those based on clinical experience.

TABLE EXHIBITING RESULTS OF EXPERIMENTAL WORK.

	" Minimum Dose " for Standard Frog.	Quantity equivalent to 0.1 Gm. Digitalis.	Dose equiv- alent to 16 Cc. Infusion Digitalis.	Dose equiv- alent to 240 Min. Infusion Digitalis.
Digitalis leaves	0.027 Gm.	0.10 Gm.	0.24 Gm.	3.6 Grs.
Infusion Digitalis	1.8 Cc.	6.67 Cc.	16. Cc.	240 Min.
Tincture Digitalis	0.18 Cc.	0.67 Cc.	1.6 Cc.	24 Min.
Tincture Digitalis, Fat free ..	0.18 Cc.	0.67 Cc.	1.6 Cc.	24 Min.
Fluid Extract Digitalis	0.035 Cc.	0.13 Cc.	0.31 Cc.	4.7 Min.
Extract Digitalis	0.006 Gm.	0.022 Gm.	0.053 Gm.	0.80 Gr.
Digitalin, German	0.0009 Gm.	0.0033 Gm.	0.0079 Gm.	0.122 Gr.
Digitalin, French	0.0006 Gm.	0.0022 Gm.	0.0053 Gm.	0.082 Gr.
Digitoxin	0.00034 Gm.	0.0013 Gm.	0.003 Gm.	0.046 Gr.
Digitalein	0.0013 Gm.	0.0048 Gm.	0.0115 Gm.	0.177 Gr.
Digitonin	Inert.			
Digitin	Inert.			
Tincture Strophanthus	0.0045 Gm.	0.0166 Gm.	0.040 Gm.	0.62 Min.
Strophanthin	0.00002 Gm.	0.000075 Gm.	0.00018 Gm.	0.0028 Gr.
Fl. Ext. Adonis vernalis	0.015 Cc.	0.055 Cc.	0.133 Cc.	2.05 Min.
Fl. Ext. Adonis vernalis	0.017 Cc.	0.063 Cc.	0.151 Cc.	2.38 Min.
Adonidin	0.00016 Gm.	0.00059 Gm.	0.0014 Gm.	0.022 Gr.
Fl. Ext. Convallaria flowers ..	0.0022 Cc.	0.0081 Cc.	0.0196 Cc.	0.30 Min.
Fl. Ext. Convallaria flowers ..	0.0038 Cc.	0.0141 Cc.	0.0338 Cc.	0.52 Min.
Fl. Ext. Convallaria root	0.006 Cc.	0.022 Cc.	0.0533 Cc.	0.82 Min.
Fl. Ext. Convallaria root	0.010 Cc.	0.037 Cc.	0.089 Cc.	1.38 Min.
Fl. Ext. Convallaria herb	0.0075 Cc.	0.028 Cc.	0.067 Cc.	1.03 Min.
Convallamarin	0.00018 Gm.	0.00067 Gm.	0.0016 Gm.	0.024 Gr.
Fl. Ext. Black Hellebore	0.006 Cc.	0.022 Cc.	0.053 Cc.	0.82 Min.
Fl. Ext. Black Hellebore	0.011 Cc.	0.041 Cc.	0.098 Cc.	1.51 Min.
Fl. Ext. Canadian Hemp	0.0043 Cc.	0.016 Cc.	0.038 Cc.	0.59 Min.
Fl. Ext. Canadian Hemp	0.0053 Cc.	0.0196 Cc.	0.047 Cc.	0.73 Min.
Fl. Ext. Bitter root	0.0057 Cc.	0.021 Cc.	0.051 Cc.	0.76 Min.
Fl. Ext. Bitter root	0.0060 Cc.	0.022 Cc.	0.053 Cc.	0.80 Min.
Fl. Ext. Squill	0.019 Cc.	0.07 Cc.	0.168 Cc.	2.6 Min.
Fl. Ext. Wahoo	0.035 Cc.	0.13 Cc.	0.31 Cc.	4.8 Min.

CONCLUSIONS.

1. Determination of the relative strength of different samples of the same drug may be made with a precision sufficient for practical purposes by physiological experiments on animals. Duplicate determinations do not differ from one another as much as ten per cent.—a difference which as yet we have to tolerate in chemical assays of such drugs as opium.

2. As might be expected, the relative medicinal strength of different drugs cannot be correctly inferred from the observation of a single symptom produced in an animal like the frog. Through a comparative study, however, of drugs by this manner, we may hope to gain a more complete insight into the action of remedies, whose effects are usually a complex of several different influences over vital functions.

MR. SEARBY: I regard this paper of Dr. Lyons as a valuable contribution for the proper determination of physiological tests of the action of certain drugs, and it seems to me in some cases the tests made are more reliable than chemical tests.

MR. LYONS: I omitted in my paper one series of experiments that I might mention here. Three preparations of fluid extract digitalis were tested physiologically, so that their relative strengths by the frog test were known. The same were then tested in duplicate by Keller's method of assay. The comparative results were quite interesting. The difference was much greater by the physiological than by the chemical test.

MR. BARTLEY: I had the pleasure of looking this table of fluids over before the paper was read, and the impression of this whole work made upon my mind was this: That the physiological test as it comes out in this table does not correspond with the clinical results; and the question at once arose with me, whether physiological tests in general are as unreliable as this—whether the physiological test after all is of any value. I have used digitalis and strophanthus side by side on the same individual frequently, and I am certain I never got from six-tenths of a minim of tincture of strophanthus the result obtained from a teaspoonful-dose of digitalis infusion. I don't think they can be at all compared in the sick-room. I certainly should not like my physician to depend upon such results.

MR. RUSBY: There is a great difference in strophanthus seed. Some are twenty times as effective as others, and some makers use the cheaper grade. I would like to ask Mr. Bartley where he got his strophanthus?

MR. BARTLEY: I depended upon the pharmaceutical profession to furnish me my tincture of strophanthus.

The chair then called on Mr. Stevens to present in brief abstract his two papers on laboratory notes, etc., and assay of opium. This Mr. Stevens did, giving some practical illustrations of the working of his mechanical shaker and separator ring. The full text of the papers was as follows:

ASSAY OF MOIST OPIUM AND THE TINCTURES OF OPIUM.

BY A. B. STEVENS.

OPIUM.

The standard of opium refers to the amount of morphine contained in opium in its original moist condition. As moist opium contains varying proportions of moisture, it is necessary to modify the lime method, as previously given for opium. Otherwise the amount of moisture in the opium increases the total volume of water, and thus produces an error in the aliquot part.

The method is as follows: Estimate the moisture in 10 Gm. of the natural moist opium, and powder the dried residue. Thoroughly mix in a mortar 4 Gm. of the dried opium with 2 Gm. of dry freshly slaked lime, add 10 Cc. of water and triturate continually for fifteen minutes until a perfectly smooth mixture results. Finally add 19 Cc. of water, triturating frequently for half an hour and filter through a dry filter about 10 Cm. in diameter. Transfer exactly 15 Cc. to a 60 Cc. bottle, to this add 4 Cc. of alcohol and 10 Cc. of ether, and shake the mixture. Then add 0.5 Gm. of ammonium chloride. Shake well and frequently during half an hour. Set aside in a cool place for twelve hours.

Remove the stopper carefully and preserve, with any adhering crystals, for future use. Pour the ethereal layer into a small funnel, the neck of which has been previously closed with a piece of absorbent cotton. Rinse the bottle with 10 Cc. of ether, and when this has passed through, pour the contents of the bottle into the funnel. Without trying to remove all the crystals from the bottle, wash the bottle and contents of the funnel with morphinated water until the washings are colorless. When the crystals have drained, place the funnel in the bottle containing adhering crystals, and with a small glass rod drawn out to a curved point, lift the cotton and rinse the crystals into the bottle with 12 Cc. of decinormal sulphuric acid, using the cotton on the end of the rod to detach any adhering crystals. Place the cotton in the bottle, replace the cork and agitate until the crystals are all dissolved. Rinse the cork and funnel with water and titrate the excess of acid with fortieth-normal potassium hydroxide solution.

The number of cubic centimeters of decinormal acid consumed by the morphine, multiplied by 1.5038, will give the percentage of morphine obtained. Multiply the per cent. of morphine obtained by one minus the per cent. of moisture, and add 1.125 per cent. for loss of morphine during estimation. This gives the per cent. of morphine in the crude opium. It is hard to reduce the dried opium to as fine a powder as the powdered opium of the market. Therefore, great care must be exercised in triturating the opium and lime in order to produce a perfectly smooth mixture. This applies also to granulated opium. Recently I have used freshly slaked lime, and prefer it to the oxide. When collecting the morphine, a little of the cotton should be forced into the neck of the funnel, and not loosely placed there. Otherwise a part of the morphine will pass through.

ASSAY OF THE TINCTURE OF OPIUM.

After a number of experiments to determine the volume occupied by the lime and extractive obtained from the tincture, I have adopted the following method for the assay of the tincture: In a tared capsule evaporate 40 Cc. of the tincture to 8 Gm., add 2 Gm. of freshly slaked lime, and rub to a uniform mixture. Transfer to a graduated cylinder, rinsing the capsule with sufficient water to make about 30 Cc. Drop upon the surface of the liquid five or ten drops of ether, thus destroying the air bubbles. Add water to exactly 31 Cc., close the cylinder with a cork and shake frequently during half an hour. Filter, and from 15 Cc. of the filtrate estimate the morphine as in powdered opium. The number of cubic centimeters of acid consumed multiplied by 0.15037, plus 0.112 gives the number of grams of morphine in 100 Cc. of the tincture. In some respects this method differs from the one given by Rittenhouse and Sayre.* While their method gives reasonably good results it necessitates the determina-

* Drug. Circ., 46, 161.

tion of a different factor for loss of morphine, as they use 20 Cc. of the lime solution instead of 15 Cc., which causes an increase in the loss of morphine.

LABORATORY NOTES.

BY A. B. STEVENS.

EMULSIONS IN IMMISCIBLE SOLVENTS.

The drug assayer is frequently annoyed by the formation of a partial emulsion occurring between two liquids which he desires to separate. I have found that the following method aids materially in the separation of the last part of the lower liquid. The clear liquid is drawn off. A coil of platinum wire fastened to the end of a glass rod is then introduced and slowly passed around in the point of the separator. As fast as the liquid separates it is drawn off and the operation is repeated. A small tuft of cotton used in place of the platinum coil is even more satisfactory.

COTTON AS A FILTER FOR IMMISCIBLE LIQUIDS.

I do not know who originated the following method, but as it is worthy of more extended use, I introduce it here. The lower orifice of the separator is loosely filled with absorbent cotton, through which the lower liquid is drawn off. It comes through perfectly clear even though the original liquid was quite cloudy. The cotton not only acts as a filter, but it prevents the liquid which naturally adheres to the tube, from dropping out of the separator.

SEPARATOR HOLDER.

Years ago I became dissatisfied with the ordinary supports for separators. These supports consisted of a retort ring or a circular opening in a piece of wood. Unless this opening was very large there was always the danger, when inserting or removing the separator, that the stop-cock might come in contact with the side of the ring, and the stopper be thus loosened. This difficulty was first obviated by cutting an opening in the side of the wooden ring (Fig. 1) so that the separator could be inserted directly from the front. Later a similar improvement was made in the ordinary retort ring (Fig. 2) by cutting out a section of the ring with a hack-saw or cold-chisel and then slipping pieces of rubber tubing over the ring. This is a great improvement on the ordinary retort ring for all purposes except as a support for evaporating dishes and all similar utensils.

MECHANICAL AGITATORS.

One of the convenient additions to the drug-assay laboratory is a mechanical agitator. There are several varieties, but the one here illustrated has been found to be extremely convenient, as any quantity of liquid can be agitated, from a few cubic centimeters in a test tube, to a gallon if equally divided, in four bottles. The construction of the apparatus may

be seen in the illustration and scarcely needs description. To run smoothly it is necessary to have each pair of arms equally loaded. When

only one bottle or flask is to be agitated, a counterpoise must be placed in the other arm. If the contents of a bottle is to be agitated and it is desired that the liquid pass from end to end of the bottle, elevate one end

of the bottle by placing a cork in one end of the trough under the bottle. The size of the apparatus from *a* to *a* is 12 inches; from *a* to *b* is 18

inches; sides of trough $3\frac{1}{2}$ inches. The apparatus is propelled by a small water motor.

Laboratory of Practical Pharmacy, University of Michigan.

On motion, both papers were referred for publication.

Mr. Kremers then presented the following paper:

GLYCEROPHOSPHORIC ACID AND GLYCEROPHOSPHATES—
A PRELIMINARY NOTE.

BY EDWARD KREMERS.

On account of the unsatisfactory character of the pharmaceutical literature concerning glycerophosphates, which have acquired some prominence as therapeutic agents in recent years, the compilation of a monograph was undertaken. In order to make such a monograph more satisfactory, experimental as well as literary investigations became necessary. Whereas the latter have been practically concluded, the former have been restricted almost entirely to the rate of esterification of glycerin and orthophosphoric acid under certain sets of conditions. In a general way the results show that the percentage of esterification increases with temperature and time, but that there are constant irregularities which manifest themselves very strikingly by plotting the results as curves. Some of the series of esterification experiments are to be repeated under greatly reduced pressure. The structure of the acid and the physical and chemical properties of the salts are also to be studied further. A complete report is to be made at the next annual meeting if possible.

MR. C. E. CASPARI: The subject of glycerophosphoric acid and glycerophosphates is particularly interesting to me, because I have done work along the same lines, and I am glad to note that Dr. Kremers experienced the same difficulties in the matter of esterification that I had. It seems to me that the irregular esterification curve, showing the formation of some ester and its subsequent saponification, can be explained as follows: In the action of the phosphoric acid on the glycerin a state of equilibrium is reached when a certain amount of ester is formed and a certain amount of water is liberated. The heated mass is very thick and viscous, and conducts heat very poorly, so that when it is heated further, it is not heated uniformly throughout, and the water formed in the esterification, before it has a chance to evaporate, reacts on the ester, saponifying a portion of it, while in another part of the mass the esterification continues. I think this is the explanation of the irregularity in the curves.

Mr. Chas. E. Caspari being called upon presented in abstract the following paper by himself and M. R. Moffatt:

THE DETERMINATION OF SODIUM CARBONATE IN SODIUM SULPHITE.

BY CHAS. E. CASPARI AND MILES R. MOFFATT.

Ordinarily there is little reason to know how much sodium carbonate is contained in a sample of sodium sulphite, but occasionally such informa-

tion is desired, and it is just as well to have on record a good method for obtaining it. No great claims of originality are made for this method, because doubtless any chemist who might be confronted with the problem of determining the percentage of carbonate in a sample of sodium sulphite, would make use of the principles which are to be described presently. However, to save others the labors of experimentation necessary to determine whether or not the method is a good one, it has been deemed advisable to present to this Association the method, as worked out in the Research Laboratory of the Mallinckrodt Chemical Works.

First, however, a few remarks about the methods in use for the determination of sulphurous acid in sodium sulphite. These are all volumetric methods of analysis, and are all, with one exception, more or less open to objection. As is well known, sodium sulphite is alkaline to methyl orange, so that a method of analysis has been worked out based on this fact. A weighed amount of sulphite is titrated with standard hydrochloric acid, methyl orange being used as an indicator. The color change occurs when all of the sulphite has been converted into the bi-sulphite in accordance with the equation $\text{Na}_2\text{SO}_3 + \text{HCl} = \text{NaHSO}_3 + \text{NaCl}$. This might be a very good method were it not for the fact that practically all sodium sulphite contains some sodium carbonate, which would be determined along with the sulphite as sulphite. Other methods for the determination of sulphites are based on the fact that iodine in the presence of water will oxidize them to sulphates, thus $\text{Na}_2\text{SO}_3 + \text{I}_2 + \text{H}_2\text{O} = \text{Na}_2\text{SO}_4 + 2\text{HI}$. Bunsen showed long ago that this reaction was carried out as represented only when the solutions of sulphite were very dilute. He showed that the solutions to be examined must not contain more than 0.05 per cent. of sulphur dioxide in order to insure the complete reaction as stated above. If the concentration exceeds this limit, the reverse reaction will take place. Later Mohr obviated this difficulty by adding sodium bicarbonate to the solution to be examined before titration. This modification enabled him to work with more concentrated solutions, but there still remained a difficulty which the addition of sodium carbonate did not overcome, and that difficulty was that solutions of sulphurous acid or of sulphites are oxidized very rapidly under the influence of dilution with water and exposure to the atmosphere. The amount of this oxidation is at times so great as to be almost incredible. It was noticed by the authors of this paper that in a 2 per cent. solution of sodium sulphite, 5 per cent. of the sulphite was oxidized to sulphate in less than 24 hours, the solution having been kept in a tightly stoppered vessel. A solution that is exposed to the air will be oxidized very much more rapidly. Even dry sodium sulphite will be oxidized at the rate of about 1 per cent. in 24 hours, unless the vessel in which it is contained is very securely sealed. By far the most satisfactory method for the determination is that proposed by Giles and Scheerer (*Jour. Soc. Chem. Ind.*, *III*, 197, and *IV*, 303), which is doubtless now

used all over the world. It avoids the necessity of working with very dilute solutions, and in using it the danger of oxidation of the sulphite is reduced to a minimum. To a measured excess of standard iodine solution is added a weighed amount of the sulphite to be examined, as a dry powder. In the case of sodium sulphite the oxidation is completed in a very few minutes, and there is no opportunity for the sulphite to be oxidized before it comes in contact with the iodine, because it is emptied directly from the weighing tube into the iodine. After the oxidation is over the excess of iodine is determined with sodium thiosulphate. The entire operation should not require more than five minutes. It might be supposed that any carbonate contained in the sulphite would have a disturbing influence on the accuracy of the results, but such is not the case, because the amount of carbonate is so small, and because the reaction between iodine and sodium carbonate is so slow that the sulphite is all oxidized and the excess of iodine determined before it could react with the small amount of carbonate. Another reason why the carbonate present does not affect the determination of the sulphite is that as soon as the iodine begins to oxidize the sulphite, hydriodic acid is formed, which immediately reacts with the carbonate to form sodium iodide, and as there is only a relatively small amount of carbonate present, it is soon removed from the field of action. There is undoubtedly some slight reaction between the iodine and the carbonate, but it is not sufficient to change the results of the analysis with reference to the sulphite more than one-tenth of one per cent. This point was tested, and it was found that a sulphite of sodium containing more than 10 per cent. of sodium carbonate required practically the same amount of iodine for oxidation whether the sulphite was added to the neutral iodine solution or to a solution of iodine containing enough sulphuric acid to liberate all the sulphur dioxide and carbon dioxide present in the sulphite. These results will be shown further on.

It is on this method of Giles and Schearer for determining sulphites that the method presently to be described of determining sodium carbonate in sodium sulphite depends. In accordance with the equation $\text{Na}_2\text{SO}_3 + \text{I}_2 + \text{H}_2\text{O} = \text{Na}_2\text{SO}_4 + 2\text{HI}$, a definite amount of iodine which is used to oxidize the sulphite will give rise to the formation of a definite amount of hydriodic acid, and this amount of acid can be calculated from the amount of iodine consumed, so that the total amount of acid in the solution after titration is known, because when the excess of iodine is determined with thiosulphate no acid is formed, as the reaction takes place in accordance with the equation $2\text{Na}_2\text{S}_2\text{O}_3 + \text{I}_2 = 2\text{NaI} + \text{Na}_2\text{S}_4\text{O}_6$. Now, if any carbonate had been present in the sulphite, it would have been neutralized by the hydriodic acid, which was formed in the oxidation of the sulphite and, at the end of the titration, the amount of hydriodic acid present would not be equal to the amount calculated to be present from the amount of iodine used in the oxidation. Hence the difference between the amount

of hydriodic acid calculated to be present and the amount actually found to be present, is equivalent to the amount of carbonate originally present in the sulphite. The amount of hydriodic acid in the solution after titration with thiosulphate can be determined by direct titration with a tenth normal solution of sodium hydrate using methyl orange as an indicator, but it was found more satisfactory to add an excess of the standard solution of sodium hydrate and to determine the excess with tenth normal sulphuric acid, using the same indicator, because the end point is more easily recognized than when titrating from acid to alkali. Thus is found the amount of hydriodic acid present in the solution after the reaction of the iodine on the sulphite is complete and after the excess of iodine has been removed by thiosulphate. If this amount of hydriodic acid found be subtracted from the amount calculated to have been formed from the amount of iodine used, the difference is equivalent to the amount of sodium carbonate originally present in the sulphite. Of course, this method is equally well applicable to the determination of sodium bicarbonate as of sodium carbonate in sodium sulphite.

In testing this method various mixtures of sodium sulphite and sodium carbonate were made, in which the percentage of each constituent present was known. These mixtures were then analyzed and the results found compared with the percentages known to exist in them.

The following tables show the results of the analyses :

No. 1. The mixture consisted of 92.62 per cent. Na_2SO_3 and 4.03 per cent. Na_2CO_3 . The remaining 3.35 per cent. consisted of moisture and Na_2SO_4 .

Found.	Na_2SO_3 .	Na_2CO_3 .
1.....	92.73 per cent.	3.83 per cent.
2.....	92.63 "	3.84 "
<hr/>		
Mean	92.68 "	3.835 "
Theory	92.62 "	4.03 "

No. 2. The mixture consisted of 88.26 per cent. Na_2SO_3 and 8.06 per cent. Na_2CO_3 .

Found.	Na_2SO_3 .	Na_2CO_3 .
1.....	88.19 per cent.	7.64 per cent.
2.....	88.38 "	8.17 "
3.....	88.35 "	7.90 "
4.....	88.26 "	7.88 "
<hr/>		
Mean	88.29 "	7.90 "
Theory	88.26 "	8.06 "

No. 3. The mixture consisted of 85.63 per cent. Na_2SO_3 and 10.68 per cent. Na_2CO_3 .

Found.	Na_2SO_3 .	Na_2CO_3 .
1.....	85.75 per cent.	10.72 per cent.
2.....	86.03 "	10.80 "
3.....	85.88 "	10.62 "
4.....	85.66 "	10.41 "
Mean	85.83 "	10.64 "
Theory	85.63 "	10.68 "

In this series in the case of No. 2, enough standard sulphuric acid was added to the iodine solution before the sulphite was added to insure the liberation of all sulphur dioxide and carbon dioxide before the titration, and it will be seen that the result is practically the same as when the carbonate was present as such.

No. 4. The mixture consisted of 81.57 per cent. Na_2SO_3 and 14.35 per cent. Na_2CO_3 .

Found.	Na_2SO_3 .	Na_2CO_3 .
1.....	81.35 per cent.	14.39 per cent.
2.....	81.76 "	14.33 "
3.....	81.14 "	14.06 "
4.....	81.38 "	14.04 "
Mean	81.41 "	14.20 "
Theory	81.57 "	14.35 "

No. 5. The mixture consisted of 72.42 per cent. Na_2SO_3 and 22.17 per cent. Na_2CO_3 .

Found.	Na_2SO_3 .	Na_2CO_3 .
1.....	72.30 per cent.	22.19 per cent.
2.....	72.37 "	21.87 "
3.....	72.48 "	22.12 "
4.....	72.29 "	22.06 "
Mean	72.36 "	22.06 "
Theory.....	72.42 "	22.17 "

The following table shows the differences between the mean results found and the theory :

SODIUM SULPHITE.				SODIUM CARBONATE.			
Theory.	Found.	Diff.		Theory.	Found.	Diff.	
I.....92.62 per cent.	92.68 per cent.	0.06 per cent.		4.03 per cent.	3.83 per cent.	0.20 per cent.	
II.....88.26 "	88.29 "	0.03 "		8.06 "	7.90 "	0.16 "	
III....85.63 "	85.83 "	0.20 "		10.68 "	10.64 "	0.04 "	
IV ....81.57 "	81.41 "	0.16 "		14.35 "	14.20 "	0.15 "	
V .....72.42 "	72.36 "	0.06 "		22.17 "	22.06 "	0.11 "	

To judge from these results the method seems to commend itself and to be worthy of acceptance. It requires only a short time for its completion and gives fairly accurate results. Care must be taken to make all

the burette readings as accurately as possible, since there are so many of them necessary, and the accuracy of the method depends more on this point than on any other.

St. Louis, Mo., August, 1902.

On motion the paper was referred to the Committee on Publication.

The Chair then asked Mr. Bartley to present his paper on organic qualitative analysis, and Mr. Bartley read the paper by title only, explaining that three years ago, at Put-in-Bay, he had read a preliminary paper on this subject, but had asked suspension of publication until he could get it into proper shape to appear in print, but that in the meantime he had only found opportunity to partially complete it, and he offered it now in that form. The following is the paper in full, as presented :

SCHEME FOR THE IDENTIFICATION OF GROUPS OF ORGANIC
SUBSTANCES COMMONLY USED IN PHARMACY,
MEDICINE AND THE ARTS.

BY E. H. BARTLEY, M. D.

The following scheme for the separation of the commoner organic substances into groups presupposes some knowledge of chemistry, and especially a knowledge of certain tests for the detection of individuals in these groups.

References are made to Muter's Analytical Chemistry, simply because that book was in use by my students, and contains tests for individual members of the groups. Any other book, as Allen's Commercial Organic Analysis, may be used. The scheme is made as brief and as simple as possible, and is intended to be used in connection with some suitable book dealing with the analysis of organic substances. The scheme has been worked by the post-graduate class in the Brooklyn College of Pharmacy and was found to be practical.

While it must be admitted that it is far from complete, it is hoped that others will improve upon it, and it may thus form a basis for the construction of a scheme that the author has often felt the need of, *i. e.*, a means of tracing an unknown organic substance to its proper group, where the usual books begin in the tests for identification.

NOTE.

The first thing to determine in any given substance is whether it is a definite compound or a mixture. *If a liquid* this is best determined by distillation when this is possible, having care at the same time to determine its boiling-point, or if more than one liquid can be distilled off, the boiling point of each, and separating each by itself. *If the substance be a solid* it is best to examine it under a microscope of low power to determine whether it be homogeneous, crystalline, amorphous, or a mixture.

If a mixture, it may often happen that the substance may be separated by a proper choice of solvents, observing the effect under the lens. Crude powdered drugs and bodies like starch, pollen, talcum, etc., may be readily identified in this way.

INSPECTION.

Observe the *Color*, *Consistency* (if a liquid), *Odor*, *Taste*, etc.

1. The *color* of definite chemical compounds of organic origin is characteristic only when they are in a pure state. When impure the color is of little service.

2. The *consistency* of a liquid, whether viscid, oily, mobile, volatile, fixed, etc., both cold and warm, is of much importance and often gives a clue to its identity.

3. The *odor* of some organic compounds, especially the liquids and some of the solids, is so characteristic as to be of great service in giving a clue to their identity; or to the exclusion of certain substances. When the substance has a distinct odor this is of great service. Some liquids give off their characteristic odor better when warm than when cold. When the odor is identified, it is best to compare the odor of the substance under examination with that of a known substance which it is believed to resemble.

Odors are described as *ethereal*, *alcoholic*, *pungent*, *ammoniacal*, *terebenthinate*, *camphoraceous*, *aromatic*, *tarry*, *putrid*, *sulphurous*, etc.

4. The *taste* of some organic compounds is highly characteristic, especially in dilute solutions.

Tastes are described as :

Sweet: As that of the higher alcohols, glycerin, mannite, etc., the sugars, saccharin, etc.

Sour: As that of the soluble acids, and acid salts.

Bitter: As that of the alkaloids, glucosides, tannic, gallic, picric acids and some resinous and bitter principles of plants.

Aromatic: As that of certain essential oils or their derivatives; the aromatic hydrocarbons or their derivatives; the phenols, cresols, aniline and their derivatives.

Burning: As that of alcohol, chloroform, carbolic acid, etc. The burning taste is usually only obtained by the pure substances.

Camphoraceous: Terebenthinate, tarry, empyreumatic and similar terms are descriptive by comparison with well known substances.

CAUTION—*Never taste a pure substance of which you know nothing!* Make a dilute solution in alcohol or water (about 1 per cent.) and then taste cautiously on a glass rod dipped into the solution.

SEPARATION OF COMPOUNDS INTO GROUPS BY MEANS OF CLASS REACTIONS.

The following are the names of the groups into which the organic com-

pounds may be divided for the convenience of study. These groups are based upon chemical structure :

Hydrocarbons,	Sulphones,	Phenols,
Alcohols,	Sulphonic acids,	Cyanogen compounds,
Aldehydes,	Haloid ethers,	Glucosides,
Ketones,	Haloid subst. compounds,	Proteids,
Ethers,	Amines,	Animal ferments,
Esters (fats and oils),	Amides (aniline derivatives),	Vegetable ferments.
Carbohydrates,	Artificial bases,	
Acids.	Alkaloids.	

" A "

Heat a portion of the substance on a platinum foil over the naked flame, first gently and then at a red heat, and observe its behavior, odor, etc.

1. It takes fire and burns, or it chars. It is organic.
2. It chars and gives off the odor of burnt hair. Nitrogenous body, animal substance or an alkaloid.
3. It explodes or deflagrates. A nitro compound.
4. It gives off SO_2 —sulphones (sulphonal, trional, tetronal, etc.), sulfo-compounds, or sulphonic acids or their salts, also FeSO_4 .
5. It gives a voluminous char and odor of burnt sugar.—Carbohydrates. The char burns off completely but with difficulty in the case of carbohydrates.
6. It chars, burns off, but leaves considerable white-gray or colored ash. Salt of an organic acid or organo-metallic compound. Treat the residue, or ash, on the foil with a drop of HNO_3 (1 to 3).
 - a. If effervescent ash—salt of an organic acid, with K, Na, Li, Ca, etc.
 - b. No effervescence and colored ash—Salt of one of the heavy metals.
 Dissolve the ash in HNO_3 or HCl and test for the metal. Test original substance for the acid (see Muter, p. 80).

" B "

Heat a small portion of the solid or of the liquid in a clean, dry test tube or matrass.

1. The substance melts, and then volatilizes or distils unchanged. Or, if a liquid, it distils unchanged giving off an inflammable vapor. (Organic substance.) Observe the odor of the vapor. Sulphones, as sulphonal, tetronal, trional, give odor of SO_2 . Many organic liquids have characteristic odors, especially on warming. Most compounds behaving as above, belong to lower series, as lower hydrocarbons, ethers, alcohols, volatile oils, aldehydes, acetals, simple phenol and cresols, and organic acids of methane series having less than five carbon atoms in the molecule.
2. It melts and chars, or decomposes. Carbohydrates (except starch

and cellulose, which decompose without melting), higher organic acids and some synthetic remedies, fats and fixed oils.

a. Odor of acrolein.—Fats, fixed oils, higher fatty acids (oleic, stearic, etc.), glycerin.

b. Gives vapor acid to litmus paper.—Acids and their salts.

c. Gives vapor alkaline to litmus.—Alkaloids, amines, some proteids and other nitrogenous bodies and ammonia salts.

3. It melts or sublimes, wholly or in part, with or without decomposition.—Benzoic, salicylic, succinic acids (see 4 and 5), camphor, resorcin, ammonia salts and some amines.

4. It does not melt but chars at once, giving off water.—Animal and vegetable tissues. Carbohydrates (sugars melt), starch, cellulose, tartaric and many other acids.

Compare "A" 5, "D" 8, "F" 1.

5. It gives off little or no watery vapor.—Some of the new synthetic remedies, heavy hydrocarbons, resins, etc.

"C"

Treat a small portion of the solid or of the liquid with diluted H_2SO_4 (10 per cent.). Observe any change of color, effervescence or odor. Disregard any precipitate.

1. Effervescence without odor.—Carbonates. Warm, test odor and then boil.

a. Effervescence with odor of H_2S .—A sulphide.

b. Effervescence with odor of SO_2 .—A sulphite or thio-sulphate.

c. Effervescence with odor of CN .—A cyanide.

d. Effervescence with odor of Cl .—A hypochlorite.

e. Odor of vinegar.—Acetic acid or acetates.

f. Red fumes or odor of N_2O_3 .—Nitrates or nitrites or acids.

g. Neutralize the solution after boiling for five minutes, and boil with Fehling's sol. It reduces = Carbohydrates (see F).

"D"

Warm a small portion of the solid, or of the liquid, with 50 per cent. H_2SO_4 .

1. Odor of vinegar.—Acetic acid or acetates.

2. Odor of SO_2 , deposit of S .—Thio-sulphates and thio-ethers, thio-aldehydes, sulphurous and sulphuric ethers.

3. Odor of CN .—Cyanides, cyanates, and sulpho-cyanates.

4. Odor of valerian.—Valerianates.

5. Characteristic pungent odors.—Benzoates (white fumes), succinates (white fumes), formates (CO effervescence).

6. Characteristic phenol odors.—Phenols, cresols, sulphocarbates. (See G.)

7. Effervescence without odor.—Oxalates or carbonates.

8. Darkens.—Maltose, cane sugar, starch, some organic acids (E-1), cellulose, proteids, unsaturated hydrocarbons, animal and vegetable substances.

“ E ”

Warm (do not boil) with strong H_2SO_4 .

1. It chars.—See “ D ” 8.

2. It darkens in color but without marked effervescence.—Meconate, tannate, gallate, pyrogallate, salicylate (but slow).

3. Effervescence.—Tartrates—Burnt sugar odor and darkens. Lactates or lactic acid. Citrates or citric acid. Sharp acid odor. Oleates or oleic acid. Acrolein odor.

4. No change in color. Aromatic odor.—Aniline derivatives and aromatic hydrocarbons, and synthetics.

5. Gives off white fumes. Characteristic odor = Benzoates, succinates, sulpho-carbolates.

NOTE.—When a positive indication for one of the acids is obtained, apply confirmatory tests at once, especially if soluble in water. It is best to make a solution in weak NaOH or KOH (10 per cent.) if these alkalies give a precipitate with the aqueous solution, and test for the acid in this solution. (See Muter, p. 77 to 80.) Before making the solution, test the original substance with litmus paper. If acid, suspect a free acid or acid salt. If neutral, and an effervescent ash was formed in “ A,” suspect a salt of an organic acid, or scale salt.

“ F ”

Heat to near boiling a fragment of the substance with diluted Fehling's Solution.

1. A red precipitate of Cu_2O .—Reducing sugars, formates, chloral, chloroform, aldehydes, ketones.

The sugars will be distinguished by their taste, and by their behavior under A-1, B-2 and D-8. Apply the furfural reaction as follows:

To 5 Cc. of a weak solution of the substance add 3 drops of a 15 per cent. solution of alpha-naphthol in alcohol. Float over H_2SO_4 . A red colored zone at line of contact of the two liquids indicates a carbohydrate.

“ G ”

Treat a neutral solution of the substance with a nearly neutral solution of Fe_2Cl_6 . Note color produced or precipitate formed. Many phenols and their derivatives give color reactions with Fe_2Cl_6 .

Amethyst color.—Carbolates or phenol, sulpho-carbolates.

Violet red color.—Salicylates or acid, salol, resorcin.

Red color.—Meconates or acid, sulpho-cyanates or acid, acetates or acid, pyrogallates or acid.

Flesh color.—Benzoates or acid, succinates or acid.

Green color.—Pyrocatechin.

Brown color.—Creosote.

Blue color.—Morphine, dionine.

Blue-violet color.—Orcin.

Black color.—Tannates or acid.

Blue-black color.—Gallates or acid.

A precipitate.—Proteids, vegetable extractives, gum, alkalies, soaps.

“ H ”

Detection and Removal of Water.

Solids.—Place in dry test tube and warm gently over flame, but do not heat hot enough to char or change the color. If drops of water appear in cold part of tube, heat in a beaker of boiling 25 per cent. NaCl solution to drive off water of crystallization and hygroscopic water.

Liquids.—Boil a few Cc. in dry test tube and test vapor with a lighted match at open end of tube. If no inflammable vapor comes off, the liquid is probably water. Test odor of vapor. Evaporate a portion of the liquid on platinum foil to see if residue remains. If a residue remains, continue heat at higher temperature to see if it is organic, and if it chars, melts or distils. If a residue remains on evaporation, it is a solution of a solid in a liquid. The residue is to be examined separately. If an inflammable vapor is given off, and its nature cannot be determined by the odor, distil a portion of it into another test tube and test this distillate. (See “I.”) Or evaporate a portion of the liquid in a porcelain vessel on a water bath, to determine if it all distils off or if some water is left behind.

Detection of water. Shake the original liquid with freshly ignited CuSO_4 .—Blue color = water.

Removal of water from mixtures with other liquids. Treat with fused CaCl_2 or K_2CO_3 or calcined CuSO_4 and let stand for some time.

NOTE.—The water if present must be completely removed by one of the above salts before making the following tests.

“ I ”

To Determine Ultimate Analysis.

All non-gaseous bodies, except P. and S. and hypophosphites which burn with flame in the air, are organic and contain C. and H.

1. *Oxygen*.—Heat gently a portion of the well dried solid in a dry test-tube, filled with illuminating gas and loosely corked, until thoroughly charred, taking care to heat only the lower end of the tubes. Drops of water condense in the cool part of the tube—N and O. (Confirm with CuSO_4 .)

2. Heat a portion of the substance with 3 or 4 times its weight of soda-lime, in a dry test-tube to dull redness, and test the gas given off with moistened red litmus paper or phenolphthalein paper, being careful that

the paper does not touch the sides of the tube. An alkaline vapor— NH_3 , —Nitrogenous compounds.

NOTE.—Nitrates, nitrites, and some nitro-compounds do not evolve NH_3 in this test.

When the preliminary tests give an indication of either of these classes, use the following :

3. To about 0.5 Gm. of the substance (liquid or solid), in a test-tube, add 2 Cc. of H_2SO_4 and about 0.5 Gm. of crystals of $\text{K}_2\text{Mn}_2\text{O}_8$, and heat slowly to boiling and boil for five minutes, adding cautiously a little more $\text{K}_2\text{Mn}_2\text{O}_8$ if the solution becomes colorless. Let cool and render alkaline with a strong solution of NaOH . Evolution of NH_3 = Nitrogen.

4. Or, put in a clean dry matrass of hard glass about 0.1 Gm. of clean metallic sodium, heat carefully until a part of it is converted into vapor, and drop 2 or 3 drops of the liquid under examination, freed from water, or a corresponding amount of the solid, directly upon the hot metal. Allow the mixture and tube to cool, add 1 Cc. of alcohol to dissolve unchanged sodium, then a few Cc. of distilled water; filter, and test the solution as follows :

For *sulphur*—with silver coin or strip of filter paper wet with lead acetate—Black stain on coin or black color on paper = Sulphur.

For *sulphur and nitrogen* together—with HCl and with Fe_2Cl_6 (red color).

For *nitrogen, without sulphur*, by testing for cyanides by adding NaOH , and then a mixture of ferrous and ferric salts and acidifying with HCl (blue color).

For *halogens*, by acidifying with HNO_3 and adding silver nitrate. Also by flame reaction on oxidized copper wire.

For subsequent tests, divide the substances into non-nitrogenous and nitrogenous. It may be well at times to repeat some of the preliminary tests, after testing for nitrogen. (See "R.")

"J"

Non-Nitrogenous Substances.

The substance is a liquid, usually having a characteristic odor, entirely volatile by a gentle heat, and is combustible. When the odor is characteristic we may apply (confirmatory) tests found in Muter, p. 87-1.

1. It is entirely volatile and not combustible, probably water. Confirm by anhydrous CuSO_4 if necessary. (See "H.") Chloroform is not combustible, but its odor would lead to its identity before this point is reached.

2. It is volatile, but leaves a distinct residue which burns off at higher temperature. A solution of an organic substance (see "H"). Distil off liquid if necessary, and test both liquid and residue. See Muter, p. 87-1.

3. The liquid is acid to litmus paper. Acids or acid salts. The liquid is alkaline to litmus. Sol. of free bases, alkaloids, etc. The organic bases all contain nitrogen. See below.

4. The liquid is neutral and not volatile at gentle heat, distils at higher temperature without decomposition. Higher hydrocarbons, fixed and some essential oils, phenol, creosote, and their derivatives (see "G").

5. The liquid is neutral, entirely volatile, yielding an inflammable vapor and usually a characteristic odor. It may be an alcohol, an ester, an aldehyde, a ketone, an acetal. The odor will be of great service here. Compare, when in doubt, with known samples.

"K"

The Substance is Non-Nitrogenous and a Solid.

Observe the color, appearance and odor. Make a weak solution in water or alcohol, and taste on a glass rod.

Sweets—Sugars, saccharin (gluside, sycose, saccharinose, glusamid), dulcin (sucrol, valgin), sugarine (repeat "F"). (See Coblentz, New Remedies.)

Acid—See above, see "B" 2, "D" 1, "E" note, "G," "J" 3, "K" 1.

Aromatic or Phenolic—Phenols (cresols, guaiacol—see "G"—"K").

Creosote odor—Guaiacol compounds (see "G" and "K").

Bitter—Glucosides, tannins, gallic acid, picric acid, pyrogallol, alkaloids.

"L"

Repeat "F," after heating a solution of the substance with a few drops of dilute HCl to boiling a few minutes.

Reduction in cold—Aldehydes (see "K").

Reduction on heating to near boiling—Lactose, maltose, dextrose, levulose, sugars, starch (see "F").

Reduction only after heating with HCl—Dextrin, cane sugar and glucosides (see "F," see Bartley, p. 369).

For tannin, pyrogallol, and gallic acid, see "G," also Muter, pages 52 and 81. They do not restore the color to bleached fuchsin solution, and they form crystalline compounds with H_2SO_4 . (Separation from alcohols and phenols.) Aldehydes give acids by oxidation with neutral H_2O_2 , while ketones do not.

"M"

To a portion of the liquid or solution of the solid in water, alcohol, chloroform or ether, add a distinct excess of bromine water, or a solution of bromine in chloroform, or in CCl_4 .

1. No decolorization and no visible action.—Saturated hydrocarbons, alcohols or ethers of the aliphatic series.

2. Decolorization with evolution of HBr.—Substitution of Br for H in unsaturated hydrocarbons. Also aldehydes, ketones or phenols. Also amines, but without evolution of HBr (see test for N).

3. Instantaneous decolorization without evolution of HBr, and without

subsequent precipitation.—Addition products from unsaturated hydrocarbons.

4. A well-marked precipitate.—A phenol (see Fe_2Cl_6 test under "G"). Aromatic amides and amines, aniline and aniline derivatives (see test for N), also proteids of all kinds, and many alkaloids (Allen, vol. IV, p. 323).

5. Violent action with production of heat.—Fats and fixed oils. (See M.)

"N"

Saponification Test.

Treat the liquid or solid with a 10 per cent. solution of KOH.

1. Complete solution.—Organic acids. Neutralize and test for individual acids (Muter, p. 80).

2. Dissolves in KOH solution with separation of an alcohol = Esters. Distil off alcohol and test distillate. Neutralize KOH solution with HCl and test for acids.

3. Does not dissolve or decompose.—Possibly paraffin or other hydrocarbon. Break, boil the substance with a strong alcoholic solution (25 per cent.) of KOH for two to three minutes. All esters, including fats and oils, saponify. Phenols, cresols, collodion and resins dissolve. (See "G.")

4. Acidify the KOH solution with HCl.—Oleic, palmitic, stearic, benzoic, salicylic, cresylic, cresotic and resin acids separate, mostly soluble in either benzene or petroleum ether. (See "G" and "L.")

Formic, acetic, butyric, propionic, citric, tartaric, succinic and oxalic acids remain in the solution. Test for these acids according to usual methods. Add BaCl_2 to a portion of the solution. A white ppt. = sulphonic acids, sulpho-carbolates, etc. (See "P.")

5. Odor of chloroform not present in original solution = chloral, chloralose, chloretone.

6. Add benzoyl chloride to KOH sol.—A precipitate = glycerin, hexatomic alcohols, soluble carbohydrates (see "K" 2).

"O"

The Detection of Hydroxyl.

To about 2 Cc. of the liquid, previously well dried and in a dry test tube, add about 0.1 Gm. of metallic sodium and observe any evolution of gas.

NOTE.—Solids must be dissolved in petroleum ether, anhydrous alcohol-free ether, or alcohol free chloroform.

1. A rapid evolution of hydrogen-water or an organic acid, except salicylic acid. (See "G.")

2. A slow evolution of hydrogen—alcohols, phenols, except resorcin (see "G"). Some aldehydes, ketones and esters.

The phenols are distinguished from alcohols, and non-aromatic alde-

hydes and ketones by their odor, their reaction with Fe_2Cl_6 ("G") and by their giving a precipitate with bromine in glycerin solution. Methyl and ethyl chlorides, bromides and iodides give off hydrocarbons with Na. ($2\text{CH}_3\text{I} + \text{Na}_2 = (\text{CH}_3)_2 + 2\text{NaI}$). Chloroform and similar substitution compounds do not react with Na in the cold. If one of the halogens has been found in "I" (4) allow the action of the Na. to subside, pour the liquid into another tube, shake out with water, filter and test the watery solution with AgNO_3 and HNO_3 . If a precipitate forms, apply usual qualitative tests to determine its identity. Aldehydes may be distinguished from alcohols and phenols by their power of reducing alkaline copper solution, or ammoniacal silver solution, and by restoring the red color to a fuchsin solution decolorized by H_2SO_3 . Aromatic aldehydes give this red color very slowly.

The aldehydes all have a rather pungent odor. The ketones are distinguished from the aldehydes by not reducing ammoniacal silver nitrate solution. Muter, p. 52. (See "G.")

Test solubility in alcohol: Sugars, starch, dextrin, insoluble. Glucosides, phenol, soluble.

"P"

The Substance Contains Sulphur.

1. It gives off the odor of SO_2 when heated on a platinum foil—(See "A"). Sulphones (may be sulphonal, trional, tetronal). Confirm by heating in a dry tube and adding, while hot, a fragment of gallic acid: Odor of mercaptan—Sulphones. (See Muter, p. 89.)

2. The substance gives off SO_2 with H_2SO_4 (See "D" 2).—Sulphuric and sulphurous ethers.

3. Boil with strong KOH, acidify with HCl, and to a portion of this solution add BaCl_2 —Precipitate: Sulphonic acid. To another portion add Fe_2Cl_6 —Red color: Oil of mustard. Odor of H_2S on adding HCl—Thio—acids and alcohols.

4. Boil with a few drops of HCl—Odor of H_2S : a sulphide. Odor of SO_2 : a sulphite, or sulphurous-ether. No odor. Ppt. with BaCl_2 : Sulphuric ethers. Odor of garlic: Mercaptan.

"Q"

The Substance Contains "N."

Taste a very weak aqueous or alcoholic solution on a glass rod.

Bitter.—Alkaloids, picric acid, and the glucosides *amygdalin* and *solanin*.

Aromatic or tarry.—Aniline in derivatives, amines, artificial bases.

Tasteless or a gluey taste and odor.—Pepsin, pancreatin, animal extracts, meat preparations.

"R"

Behavior on Foil. (See "A")

1. Burns off completely with odor of burnt hair, or leaves a small amount of ash mostly $\text{Ca}_3(\text{PO}_4)_2$.—*Animal products.*

2. Chars and burns off leaving a considerable ash which effervesces with HNO_3 .—Salts of organic acids containing N. *Test ash for metal, and original solution for acid.*

3. It is visibly crystalline, and burns off completely with or without pungent odor.—*Alkaloid or synthetic.*

4. It burns with explosive violence—nitro-compound or nitrite—*picric acid, nitro-glycerin* (not crystalline), *gun cotton.*

"S"

Solubility.—Test solubility in alcohol with the aid of heat.

1. *Insoluble-animal products.*

Dissolve in 10 per cent. solution of KOH or NaOH, and add one or two drops of CuSO_4 solution. Violet solution if a proteid, rose red if peptone or albumose. Confirm by Millon's reagent (see Bartley, p. 503).

2. *It is soluble in alcohol.*

a. *Taste Bitter.*—Suspect and test for alkaloids. (Muter, p. 84, Bartley, p. 447.)

b. *Taste Aromatic or Indifferent.*—See Muter, p. 84, et 8.

c. Add to one part of alcoholic solution three parts of water. A precipitate indicates resinous matter (usually not nitrogenous) or a free alkaloid or synthetic base or derivative. Bases usually freely soluble in water, acidulated with HCl (salty taste). Free bases are alkaline to sensitive litmus paper.

Synthetic bases containing lower hydrocarbon radicals are alkaline to test paper, have pungent odor, and give no precipitate with bromine or I in KI. Synthetic amines and amides usually melt and distil without decomposition. *Distinction from alkaloids.* (See group precipitants, Bartley, p. 477.)

Tannic acid precipitates the alkaloids in acetic acid solutions, but does not generally precipitate the synthetic bases. (Exception, quinoline.)

Synthetic bases and their salts are generally soluble in petroleum ether. Salts of the native alkaloids are generally insoluble. (Exception, piperine soluble.) (See Allen's Commercial Org. Anal., Vol. iii, Part 2, p. 158.) Mayer's Solution precipitates all official alkaloids except caffeine, and few, if any, synthetic amides or amines.

Bismuth-potassium iodide precipitates alkaloids, and also acetanilid, antipyrine, and the quinoline bases.

"T"

Primary, Secondary, and Tertiary Amines.

Warm the substance with HCl, CHCl₃, and alcoholic KOH ; carbylamine odor.—*Primary Amines* or NH₂. Make solution in dilute HCl, and add a solution of NaNO₂.

- a.* Primary amines and primary amides give off nitrogen (latter slowly).
- b.* Secondary amides and amines give nitroso-amines, which separate in oily drops, while tertiary amines give no reaction. The nitroso-amines and amides give a green color with the addition of phenol and H₂SO₄. (The mustard oil reaction for secondary amines and amides.)
- c.* Aromatic amines and amides usually give precipitate with Br. water.

THE CHAIRMAN: We have three more papers to be read by title and referred. Two of them come as contributions from the Research Committee, and are as follows: "Contributions to the Pharmacology of Narcotine," by A. C. Crawford, A. R. L. Dohme and C. E. Vanderkleed, and "The Active Principle of Ergot," by Mr. Crawford and Mr. Dohme. The other paper is by Mr. John M. Lindly, on colors in wall paper.

THE CHAIRMAN: A motion will now be in order to receive the papers that have not yet been received, and refer to the Committee on Publication. Some of them have not yet come in.

Mr. Kremers, seconded by Mr. Caspari, moved accordingly, and it was so ordered.

THE CHAIRMAN: Reports of committees are now in order. I believe we have but one report, and that from the Committee on Chairman's Address.

Mr. Coblentz made the report as follows:

Chairman of Scientific Section of the American Pharmaceutical Association:

Dear Sir: Your committee appointed to consider the recommendations of the retiring Chairman's address beg leave to report as follows:

It is recommended that the Pharmacopœia Committee authorize the continuance of the work of the Sub-Committee on Proximate Assays, which should extend over the entire period of ten years following the last revision, and that the results be reported from year to year to the Scientific Section of this Association. During past revisions, the Pharmacopœia Committee has, as far as the funds available permitted, carried on investigations in various fields, and while we recognize the value and desirability of more work being concentrated on the subject of proximate assays, yet this recommendation will largely depend upon the size of the fund which may accumulate after the issue of this coming revision. We presume that the Chairman of the Committee of Revision will have no objections to the presentation of the results of future investigations to the Scientific Section.

The criticism relative to the extreme rigidity of present Pharmacopœia standards is a point well taken and fully recognized by the Committee of Revision, and such errors of stringency will certainly be corrected.

V. COBLENTZ, *Chairman*,
A. B. LYONS,
J. M. GOOD.

Mr. Puckner moved to accept and adopt the report, and the motion prevailed.

THE CHAIRMAN: The next order of business is the installation of officers, and I will ask Mr. E. L. Patch and Mr. Virgil Coblentz to kindly escort our Chairman-elect, Mr. J. O. Schlotterbeck, to the chair.

These gentlemen performed that pleasant office, and the Chairman said :

Mr. Schlotterbeck, you need no introduction to this Section, and I know you will have the hearty support of its members. We have received thirty-three papers for the past year, and I know you will not fall far short of that. I congratulate you upon your selection to fill the honorable position of Chairman of the Scientific Section.

MR. SCHLOTTERBECK: Gentlemen, I appreciate the honor you have conferred on me by naming me as your Chairman for the ensuing year, but I question the wisdom of your selection. Without any affectation, I feel constrained to say that I do not believe I am well fitted to perform the duties. But like the man who was struck by lightning and had to accept the issue, I accept this issue. There is one consolation I have, and that is that the members of the Section do most of the work. It has been due to their work that we have had successful sessions in the past, and I am sure our work during the ensuing year will be successful, also. Gentlemen, I thank you.

Mr. Schlotterbeck took the chair.

THE CHAIRMAN: I am very glad to know that you have selected as Secretary to assist me in this work Mr. Joseph W. England, who has had experience in that line and will give me valuable advice.

There were calls for Mr. England, who responded to the call and said :

I am deeply sensible of the honor conferred on me in continuing me as Secretary for the coming year. In these days of strenuous commercial activity in the drug business, I realize all the more the necessity of giving attention to the scientific side, and I shall certainly co-operate with the Chairman in the effort to make the work of the Section highly satisfactory. I thank you for the honor. [Applause.]

THE CHAIRMAN: We have selected as our Associate Member on the Committee for the coming year Mr. Francis Hemm, of St. Louis. [Applause.]

Now is there any new business to come before the Section? If not, a motion to adjourn, to meet a year hence—I do not know where—will be in order.

Mr. Puckner moved to adjourn, and the motion was put and carried.

The following is the full text of the papers read by title.

ORGANIZED WATER AS A FOOD.*

BY JOHN URI LLOYD.

Some years ago a professional friend declined a dish of soup, stating that he did not care to load his stomach with so much water in order to obtain the trifling amount of nourishment it contained. Shortly after this, the writer listened to an able paper read before the Cincinnati Section of the American Chemical Society on the subject of "Foods," and in this paper was struck by the fact that the nutrient value of the respective foods was determined through consideration of materials absolutely free from water, which brought to his mind the observation of the professional friend before alluded to.

Without a doubt the majority of people accept that the function of water in food substances is that of a solvent only, or as an inactive vehicle provided only to carry food to tissue and bone. They believe that the object of water as a drink is to dilute the fluids, wash impurities from the blood, and carry off worn-out tissue. Water is not seriously considered in the light of an integral part of food by any one, such solid substances as starch, sugar and nitrogenous and fatty tissues being usually cited as the constructive and heat-producing agents. Our works on digestion and on general physiology state that most foods are three-fourths water, and the human body, bones included, over two-thirds water, but yet consider water irrelevant as a nutrient. The upbuilding and tearing down of tissue, the production of salts and products of disintegration, both normal and abnormal, are studied solely from the basis of molecular change, in which nitrogen, hydrogen, carbon and oxygen play their respective parts as such.

With this thought in mind, let us for a moment consider the part of water as an organizing structural agent in certain salts, because many inorganic crystals depend for their form and structure on water of crystallization. But, it may yet be argued, after having gone through the list and studied their various departments, that crystals are dead structures; organic bodies are now the subject of discussion.

Take, then, the jelly fish, that transparent, quivering, vitalized something, shaped after laws as uniform in action as a mathematically-made creation can be. It possesses the power of voluntary action and lives upon structures seemingly much higher in life's scale; has the power of attacking the higher animals, and possesses in itself an individuality that renders it a living, moving creature. On being dried it almost disappears, leaving a film of varnish possessed of so little solid matter as to

* The author ventures to present herewith a line of thought that his study of the organic materia medica involving life structure has convinced him is essential to their proper comprehension. The subject is touched in a general way only and but lightly, because in such a case as this it is best to leave specific points to the reflective deliberations of those whom such reasonings may attract. Presented to the American Pharmaceutical Association, Philadelphia, 1902.

disturb the thought of one who attempts to argue that the water of this creature is simply water of association, devoid of any other quality than that of ordinary water.

Consider some species of fungi that spring up in a night and in the sun the next day dry to bare fragments of themselves. In their natural condition these water-structures partake not only of the attributes of their respective species, but are most marvelously exact in every detail, possessing qualities that seemingly forbid the thought that the great mass of water present is simply a carrier of insignificant amounts of solid matter.

The cabbage, the apple, the fruits of our orchards, the vegetables of our gardens, contain in all cases an enormous amount of water, if we consider the fluid part of the mysterious liquids present in vital juice and organic structure as simply water. Here we are confronted with conditions in which relationships between the large amount of water and the small amount of solid are such as to tolerate the view that this water of combination may be a something very different from pure water, or water obtained by tissue destruction. With such complex examples in mind, we are led consistently to inquire whether such dishes as soups and other aqueous liquids, and water-bearing or water-assimilating foods, can, as tissue-feeders, be in themselves anything beyond simple solutions of solid matters in water.

In order to make a nourishing soup it is not alone necessary to mix water and solid material. Good soup of complex composition requires for its production a certain amount of manipulation, such as boiling, seasoning, and cooking. These processes are purely physico-chemical, and productive of numerous dissociation and combination products.

The question is, has the water that is used in the making of a soup, by the action of heat, simply dissolved certain salts and tissues, or has it combined with organic constituents in a way that will make a nourishing liquid or a series of water combinations, in which water exists, it is true, but with altered qualities?

Nitrogenous food becomes a supporter of nutrition in a manner impossible in a case of pure nitrogen, which is not available as food and cannot be assimilated as such. Carbon, as carbon, pure and simple, is useless as a food. Hydrogen serves its purpose as a food only when in combination. These three bodies are constituents of food, and when obtained by destruction of flesh and fat, are cited by food theorists as a basis for calculating food values. Yet in a state of isolation, they are not available as foods. Only when combined with water, or by means of water, do they become tissue-builders or heat producers, and of this fact the analyst takes no account whatever beyond a bare reference to the presence of water as such. However, the object of the writer is not in any way to oppose the work that has given us the values of these elements as such, in nutrition. These investigations need not be disturbed, nor need the vital

importance of these elements, even if full credit be given the province of the water molecule.

Nations widely separated may thrive upon food structures unknown to each other, but never does man or animal dispense with water of combination, and most animals must drink water as well as eat it. This fact of observation brings us to the question before intimated, as to whether it is possible for liquid foods or foods hydrated during the process of mastication and digestion, to be possessed of chemical characters as yet outside the equation of our known chemical equivalents? In other words, do undetermined molecular combinations that ensue during cooking, as well as mastication, create complex, nutritive water structures, capable of carrying their qualities to the tissues they finally reach and nourish by reason of their easily alterable structures?

We call water driven off in the drying of fruit or food of any kind, water of separation. May it not be rather the result of structural molecular decomposition? In the cooking of dry foods we not only change their structures as regards relationships of solid constituents, but add thereto the qualities that combined water gives under conditions as yet obscure. The same is true of vegetables and fruits. Should we not look on such water, necessary as it is to life, digestion, and tissue replacement, as an integral part of food, instead of simply a carrier of food? It is indeed probable that the student of dietetics must soon broaden his field and consider foods in their structural entirety, rather than from their analytical created ultimates. The method of the analyst now is to first kill the animal or vegetable, then destroy the tissue, then disrupt the molecules. The final result gives him inorganic elements and a few characteristic chemical structures, on which he bases his tables concerning food valuations. Is this just, in the light of what we know concerning the province of vitalized structures as a whole; is it rational, in the light of what we know concerning the worthlessness of chemical elements in foods? Is it not more rational to accept that the exceptional value of albumen and other nutrients, as typical foods, rests on the water compounds so nearly in accord with tissues craving just such vitalized water-bearing structures?

But to pass to a point beyond molecular water itself, which in both crystal and colloid tissue is capable of expulsion by desiccation. When organic matter is perfectly dried, a considerable portion of the residue is found to be composed of elements that might have been derived from, or subsequently might be combined into water. Take from desiccated tissues the elements that might have come from water dissociation, and comparatively speaking, we have but a small amount of residue.

Consider the soups, custards, gelatin, pies, fleshs, fish and fruits of all kinds, and even bread, which contain in themselves enormous amounts of water, in most cases the larger share of their weight being water, and

observe the composition of the solid materials that remain after they are dried. These, too, are found to be made up of elements that in themselves may have been derived from water—fragments, we may say they are, of broken water molecules.

Consider the carbohydrates, dry as dust, sugar being typical of these, in which the elements of water are combined with carbon in the very proportions necessary to form water. The largest amount possible of a water-producing compound (pulverulent water), is here artfully stored in contact with the great combustible carbon. We have series of food solids, differing only in the proportion of water present (sugar, starch, glucose, etc.), and that many combinations of one substance and water in different proportions exist, is shown when we consider series of hydrated salts exemplified by such bodies as the crystalline manganese and sodium sulphates, etc., etc. We should not suspect that such have an existence but for the fact that as definite water compounds, they assume a visible form and become sensible to sight and touch. But of the liquid outreaches connected with changes in colloidal metamorphosis, we know next to nothing. If this shading of compounds, differing only in water compounds, is true of such elementary salts and solid foods, may not water be combined in an untold number of liquid organic structures that are as yet invisible, uncrystallizable, unreachable to our senses as organized bodies?

But enough for the present. In a time to come it may be clearly seen that students of food and digestion have not given sufficient prominence to the one thing that supports life, governs life, nourishes life, that feeds all structures, that constitutes the larger share of all organic tissues, but that strangely enough in itself is now viewed as a carrier only of something else.

We feel justified in anticipating that the immediate future will give a more extended view than the circumscribed atomic theory affords, which to this date, as a stepping-stone, has served the world well. Shall we then perceive that the vitalized water of organized water-bearing foods, and the combined water of such foods as carbohydrates and fats, are the foundations of the real foods for tissues, affiliating other materials, such as nitrogen, carbon, hydrogen, necessary in their field, but subject to the dominating agent, water? Organic chemistry has been defined as a study of the migrations of the carbon atom. May we not anticipate that organic structures will then be defined as products of the migration of the water molecule?

Possibly the makers of food products of the future will give less attention to analytical values concerning dead elements and more to vitalized and vitalizing structures in which available water is conspicuous. Possibly it behooves us even now to ask if a closer inquiry into the water molecule *the vitalized or easily vitalized water molecule* and its many shadings, may not open up a field for the construction of more rational food products.

THE ALKALOIDS OF ESCHSCHOLTZIA CALIFORNICA.

BY RICHARD FISCHER, MADISON, WIS.

In a previous paper* on the alkaloids of the California poppy, the author reported the presence of protopine and β and γ homochelidonine in this plant, while the existence of slight quantities of sanguinarine and chelerythrine in the rhizome was regarded as highly probable. No traces of morphine, which had been reported by Bardet and Adrian,† could be obtained. At the same time, the author mentioned that by the method of isolation used (extraction with dilute acetic acid, precipitation of organic acids, etc., with lead acetate, removal of lead with hydrogen sulphide, etc.), small quantities of most alkaloids could easily be lost, while others are quantitatively precipitated with the lead sulphide so that a repetition of the work, employing a different process, seemed necessary.

With this end in view, the following research was undertaken with the assistance of M. E. Tweeden, who performed most of the experimental work :

The material with which this research was conducted consisted of 6 K. of the dried herb and 1 K. of the dried root of *Eschscholtzia Californica*, representing the commercial drug and identified by comparison with known specimens. The root was in good condition, but the herb had the appearance of having been collected from the dry plants. In fact, the most careful treatment failed to discover anything except small quantities of protopine in the herb, so that the detailed discussion of the processes to which it was subjected will here be omitted.

After carefully removing accidental contaminations, the roots were reduced to a No. 30 powder, moistened with 5 per cent. acetic acid, packed in a percolator, and exhausted with 2½ per cent. acetic acid, as shown by a test with Mayer's reagent. The percolate was then made alkaline with ammonia water, whereby a slight precipitate was formed, which was separated from the liquid portion by decantation and filtration. The precipitate, though giving alkaloidal reactions, was not further examined for lack of time. The ammoniacal filtrate was repeatedly passed in a fine stream through a high column of chloroform in a special apparatus until practically free from alkaloids. Whenever the chloroform became decidedly colored, due to solution of extractive matter, it was removed to a flask and distilled, the distillate being used over and over again. The united chloroformic residues thus obtained, allowed to evaporate to complete dryness, constituted a brown amorphous mass which was dissolved in a little alcohol. Upon standing for a short time, a large number of prismatic crystals (A) separated out. Since these were almost insoluble in alcohol, they were recrystallized several times from a mixture of chloro-

* Proc. A. Ph. A. (1901), 49, p. 438.

† Journ. de Pharm. et de Chimie (1888), 18, p. 525.

form and alcohol, highly refractive colorless crystals resulting, melting at 207°C . (uncorr.), and showing the characteristic forms as well as color reactions of protopine.

Upon evaporation of the mother-liquid from (A), a second crop of crystals (B) was obtained, in which two shapes could readily be distinguished: (1) prismatic crystals, and (2) small double convex crystals grouped into large rosettes. The former were identified as protopine; the latter after several recrystallizations from hot alcohol, in which they were fairly soluble, melted at $157\text{--}158^{\circ}\text{C}$., but still retained a brownish yellow color. Dissolved in acidulated water, precipitated with sodium carbonate and shaken out with ether, crystals were obtained, which, recrystallized from alcohol, were perfectly colorless and melted at $158\text{--}159^{\circ}\text{C}$. Their m. p., as well as color-reactions, identified them as β homochelidonine.

The mother-liquid from (B), upon further spontaneous evaporation, yielded some more β homochelidonine, together with small prismatic crystals, which, upon recrystallization from a mixture of chloroform and alcohol, resolved themselves into three kinds: (1) prisms melting at $201\text{--}202^{\circ}\text{C}$.; (2) rosettes melting at 242°C .; and (3) coarsely granular crystals, melting at 215°C . The first upon recrystallization proved to be protopine. The second (subsequently referred to as alkaloid α), when recrystallized several times from alcohol to which a few drops of chloroform had been added, were obtained in colorless rosettes, made up of needle shaped crystals melting at $242\text{--}3^{\circ}\text{C}$. The third (alkaloid β) were recrystallized from a mixture of chloroform and alcohol, yielding colorless, coarsely granular crystals, melting sharply at 217°C .

By spontaneous evaporation of the original mother-liquid more protopine and β homochelidonine were obtained, besides fine feathery needles melting at $242\text{--}243^{\circ}\text{C}$. The latter were insoluble in acidulated water, in hot alcohol, chloroform or ether, thus showing their non-alkaloidal character. As to their chemical nature, no investigations were attempted, since the quantity of material was very small.

The above indicates briefly the method adopted in the separation of the several alkaloids. The actual process was of course much longer, since frequently a large number of fractional recrystallizations were necessary to accomplish complete separation and purification.

ALKALOID α .

The alkaloid above referred to as alkaloid α , was difficultly soluble in cold, more readily in hot alcohol, very soluble in chloroform. It could best be recrystallized by spontaneous evaporation of a solution in chloroform-alcohol (1-4). Repeatedly purified in this manner, it was obtained in perfectly colorless rosettes, made up of individual thin prisms. Upon heating, the crystals commenced to darken at 234° , melting at $242\text{--}243^{\circ}\text{C}$. (uncorr.). With general alkaloidal reagents the following behavior was observed:

Concentrated sulphuric acid dissolves the pure alkaloid to form colorless solutions.

Froehde's reagent (0.001 Gr. sodium molybdate in 1 Cc. conc. sulphuric acid), when treated with a small crystal of the base, becomes reddish-brown, gradually turning to wine color.

Erdmann's reagent produces a dirty yellow color with a small quantity of the alkaloid; this color gradually grows darker to a light brown.

If *concentrated nitric acid* is poured upon a crystal of the alkaloid, a dark orange color results, turning lighter to a yellow, then fading.

Solutions of the alkaloids in dilute acids gave delicate reactions with most general alkaloidal precipitants. In dilutions of 1–10,000, prepared with the aid of a few drops of hydrochloric acid, precipitates occurred as follows:

Potassium mercuric iodide—white precipitate.

Potassium bismuth iodide—reddish precipitate.

Potassium cadmium iodide—no precipitate.

Iodine in potassium iodide—reddish precipitate.

Phosphomolybdic acid—white precipitate.

Phosphotungstic acid—white precipitate.

Tannin—brownish precipitate upon standing.

From the results obtained in this and in my previous investigations it will be seen that the number of alkaloids present in *Eschscholtzia Californica* is probably seven: protopine, β and γ homochelidonine, "alkaloid *a*," "alkaloid *b*," sanguinarine and chelerythrine. As far as could be determined from the small quantities obtained, the alkaloids designated as *a* and *b* differ from any alkaloids thus far known.* Further investigations will be undertaken with larger quantities of material to decide this point as well as to throw some light on the chemical nature of these bases. Since there are a number of species of *Eschscholtzia* growing in California (*Greene* mentions ten), which might vary somewhat in their alkaloidal contents, special care will be taken to secure perfectly reliable and uniform material for these investigations.

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THE ALKALOIDS OF DICENTRA CUCULLARIA.

BY RICHARD FISCHER, MADISON, WIS.

Synonyms: *Dicentra cucullaria*, *D. C.*; *Bicuculla cucullaria*, *Mills.*; *Fumaria cucullaria*, *L.*; *Diclytra cucullaria*, *D. C.*; *Diclytra cucullaria*, *T. & G.* Dutchman's breeches; soldier's cap; boys and girls.

The genus *Dicentra* (also known as *bicucullaria*, *bikukulla*, *capnorchis*,

* *Wintgen* (Inaug. Diss., Marburg, 1898) isolated from *Fsch. Cal.* some feather-like crystals melting at 214°C, for which he gave some color reactions; these, however, differ radically from the corresponding reactions of alkaloid *a*. It is not improbable, however that he had in hand some of the latter alkaloid, highly contaminated with protopine.

cucullaria, dactyliscapnos, diclytra, encapnos, lamprocapnos, macrocapnos) of the N. O. Fumariaceae, now frequently classed as a sub-order of the Papaveraceae, is represented by about fourteen species growing in North America and western Asia, the most widely known being the *D. spectabilis*, originally native to northern China, but now cultivated as a garden flower in all temperate climes.

The northern United States harbor three species of the *Dicentra*, viz., *D. cucullaria*, *D. canadensis* and *D. eximia*. Of these only *D. canadensis* seems to have been examined chemically, although it is probable that all three contain alkaloids, since all members of the fumitory family as well as all members of the closely related poppy family, as far as investigated, have been found to be alkaloid bearing. *Dicentra canadensis*, *Walp.* (*Corydalis canadensis*, *Goldie*; *Bicuculla canadensis*, *Mills*; *Corydalis formosa*, *Pursh.*) was investigated in 1855 by W. T. Wenzell,* who found in the tubers an alkaloid, supposed by him to be identical with corydaline, besides fumaric acid, bitter extractive, resin, and volatile oil. Battandier† in 1892 reports the presence of fumarine (protopine) in several Fumariaceae, among them *Dicentra*, but does not mention the species. The evidence furnished by the latter investigator is moreover not very convincing, being confined to a few color reactions. While the investigations below described were being carried on, J. Gadamer‡ published a paper on *Dicentra spectabilis*, showing the presence of protopine in this plant, besides indications of other alkaloids.

According to Dragendorff,§ the herb of *D. cucullaria* has been used medicinally as a diuretic and blood purifier, but it has probably never been extensively employed. However, the root and tubers of *D. canadensis* have been highly recommended as an antisyphilitic, tonic and diuretic, being used by eclectic practitioners in the form of an extract, fluid extract and the resinoid "corydalin." The National Formulary also recognizes a fluid extract of the latter drug.

The following work was undertaken with the assistance of *O. A. Soell*, to determine whether *D. cucullaria* contained alkaloids, and especially to see whether it contained protopine, the characteristic alkaloid of the Papaveraceae and Fumariaceae:

The material for this investigation consisted of the whole plant, collected in the woods and on the hillsides in the immediate neighborhood of Madison, Wis., during the early part of May, when the plants were in full bloom. The plants were carefully air-dried, the bulbs separated from the herb and worked up separately, the total quantity of the former being 500 G., of the latter 1 K. Both were subjected to a similar process for

* Am. J. Pharm. (1855), 25, p. 207.

† Comptes Rendus (1892), 114, p. 1122.

‡ Apoth. Ztg. (1901), 16, p. 621.

§ Medicinal Pflanzen.

the isolation of the alkaloids. To attempt to give a detailed account of this process would be well-nigh impossible, since it was a rather long and tedious one, requiring innumerable fractional crystallizations, besides other methods of purification employed as the nature of the case seemed to demand. In brief, the method used was as follows: The powdered crude material was extracted with dilute acetic acid in a percolator, ammonia added in excess to the percolate, the resulting precipitate (A) collected and dried, mixed with powdered glass and extracted in a Soxhlet extraction apparatus, first with ether, then with chloroform. From the chloroformic extracts, though they gave alkaloidal reactions, no crystalline bases could be isolated. The ethereal extract from the herb yielded needle-shaped crystals upon cooling; these were, however, accidentally lost in an attempt at purification. From the ethereal extract of the bulbs (by taking up with acidulated water, precipitation with sodium carbonate, shaking out with ether and with chloroform, etc.), crystals of protopine were obtained, as well as small quantities of another base, melting at 231° C. This latter alkaloid is more fully described below.

The ammoniacal filtrates from (A) were freed from alkaloids by passing numerous times in a fine stream through a long column of chloroform in a special apparatus. The chloroform was regained by distillation, the residue taken up with acidulated water, rendered alkaline with potassium carbonate, and shaken out, first with ether (B), then with chloroform (C). From the ethereal shakings of both herb and bulbs, highly refractive, prismatic crystals separated out upon standing; these, after several recrystallizations from chloroform-alcohol, melted at $206-207^{\circ}$ C. (uncorr.), and gave all the characteristic reactions of protopine. The residue left after evaporation of the ethereal mother-liquid was taken up with alcohol and yielded by successive fractional crystallization, besides chloroform, fine colorless needles, which on account of their low specific gravity could be readily separated from the heavier protopine crystals, by suspension in alcohol. Collected on a filter, washed with alcohol and dried, they melted at 231° C. (alkaloid ϵ). Upon spontaneous evaporation of the mother-liquid from the herb, coarse needles were also obtained, which, separated mechanically and recrystallized several times from alcohol, appeared as fine granular crystals, melting at 215° C. (alkaloid δ). The chloroformic shakings (C) of both the herb and bulbs, after subjecting to numerous processes of purification, finally yielded some protopine as well as small quantities of the alkaloid ϵ .

DICENTRA PROTOPINE.

The identity of the alkaloid obtained as above described and melting at $206-207^{\circ}$ C. (uncorr.) with protopine was unquestionable, although no analyses of the substance were made. The m. p., the characteristic crystal forms, the solubilities, as well as the behavior toward alkaloidal color

reagents were identical with protopine from *Eschscholtzia* Cal., *Sanguinaria* Can., *Glaucium flavum*, and *Chelidonium majus*, with which it was compared.

ALKALOID *c*.

The alkaloid above designated as "alkaloid *c*," was almost insoluble in alcohol, and only slightly soluble in chloroform. Exposed to sunlight, it rapidly turned yellow. The original needle-shaped crystals were purified by dissolving in boiling chloroform. Upon spontaneous evaporation of the solvent, crystals separated out in the form of rosettes, composed of individual fine needles. Washed with chloroform and dried, the crystals melted at 231° C. (uncorr.) with decomposition. Aqueous solutions, prepared with the aid of a little hydrochloric acid, gave precipitates with general alkaloidal precipitants. With alkaloidal color reagents, small crystals of the alkaloid showed the following reactions:

Conc. sulphuric acid: Brick red, changing to orange, then to yellowish brown.

Erdmann's reagent: Reddish, rapidly turning to orange, then brown, finally violet.

Fræhde's reagent: Reddish, orange, brown, violet.

Conc. nitric acid: Blood red, soon turning yellow.

ALKALOID *d*.

The yield of this alkaloid was too small to allow of any but the most simple tests. Recrystallized from alcohol, in which it was fairly soluble, it was obtained in fine granular crystals, melting at 215° C. (uncorr.). Dissolved in acidulated water, precipitates were produced with the following reagents: potassium mercuric iodide, potassium bismuth iodide, iodine in potassium iodide, tannin, phosphomolybdic acid, phosphotungstic acid.

Conclusion: *Dicentra cucullaria* contains at least three alkaloids, one of which is protopine. Whether or not the other two are identical with alkaloids already known, will be determined by further investigations which are now under way. Investigations on the alkaloid of the related *Dicentra canadensis* are also being carried on.

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THE PRESENCE OF ARSENIC IN CHEMICALS.

BY LYMAN F. KEBLER.

The immediate reason for this investigation was the unfortunate wholesale poisoning in Manchester, England, about two years ago. At first it was thought that this poisoning was due to the alcohol imbibed by the excessive drinking of beer; but investigation showed that the poisoning was probably not due to alcohol, but rather to the arsenic contained in the beer. That is, the poisoning, instead of being alcoholic neuritis, was arsenical neuritis, or perhaps a mixture of both; the source of the arsenic

being arsenical glucose which was used in the manufacture of the beer; the glucose in turn being prepared by the intervention of arsenical sulphuric acid.

When this fact became known, nothing was more natural than that other products, in the preparation of which sulphuric acid is employed, should be investigated. The chemical and medicinal remedy which is used in such large quantities by the laity, is sodium phosphate. This product was carefully examined, both abroad * and in this country,† and found to contain more or less arsenic. One sample of the imported material was found by the author to contain 1 mg. of arsenous oxide in 5 Gms. of the chemical—an amount which certainly might cause alarming symptoms when taken *ad libitum*.

In 1775 Scheele ‡ made the important discovery that arsenic united with hydrogen to form a fetid gas which decomposed by heat. Proust § observed that this same gas was disengaged when arsenical tin was dissolved in hydrochloric acid, and arsenic was deposited when the inflamed gas was brought against a cold surface. Trommsdorf || next announced that arsenical hydrogen was evolved when arsenical tin was treated with dilute sulphuric acid, and if this gas was passed through a sufficiently long tube, arsenic was deposited on its walls. Arsenical hydrogen was farther studied by Davy, Gay-Lussac, Gehlen, Stromeyer, Thenard; and Serrullas in 1821 proposed to utilize the above reaction for a toxicological test.

In 1836 ¶ Marsh published his celebrated Memoir entitled "Account of a Method of Separating Small Quantities of Arsenic from Substances with which it may be Mixed." He elaborated and simplified the apparatus, generated hydrogen by means of dilute sulphuric acid and zinc, inflamed the escaping gas, and deposited the arsenic in the form of metal, which afterward could be converted into arsenous oxide. This brief review amply shows that Marsh was not the discoverer of the arsenic test, which is usually called by his name, but like many other useful processes and inventions, it seems to have been gradually evolved by the combined efforts of many minds. This, however, must be said, that Marsh was the first to simplify and prominently bring forward the test very much improved, if not perfected.

Little probably did these early investigators think that this method

* 1900, Chemist & Druggist, 1034.

† 1900, Amer. Drug., 37, 103.

‡ 1775, Memoires de Scheele, t. I. 170: Om Arsenick och dess Syra; Kongl. Svenik. Vatenikops Academiens Handlingar: Ar. 1775, V. 36, 265.

§ 1798, Ann. de Chem., 28, 213. 1800, Journ. de Phys. et Chem., 51, 173.

|| 1803, Nicholson's Journal, 6, 200; from Royal Academy of Sciences, Berlin, page 370.

¶ 1836, The Edinburgh New Phil. Journal, 21, 229; 1837, Journ. de Pharm., 23, 553; Ann. (Liebig), 23, page 207.

would be more thoroughly investigated than any other process in the realms of chemistry.

Many other methods have been suggested from time to time, but not one of them as yet has been proved the superior or even the equal of Marsh's test modified in one form or another.

The method next important to Marsh's is undoubtedly Reinsch's,* in which metallic copper is employed to deposit the arsenic, which it is claimed forms a definite chemical compound with the copper, Cu_3As_2 . Fleitman's † method is practically a modification of Marsh's test, in which the hydrogen is generated by means of an alkaline solution, acting on metallic aluminum or zinc. By Bettendorff's ‡ method, the arsenic is deposited as a metal, in a stannous chloride solution, upon metallic tin. Gutzeit § utilized the well-known reactions of arsine on paper moistened with a solution of mercuric chloride, or acidulated silver nitrate.

The last three methods are the ones employed by the United States Pharmacopœia to detect arsenic in the compounds recognized by it. The object in employing these methods was primarily because they were comparatively simple, and at the same time gave fairly accurate results. When it is a question of testing for the presence of arsenic in any compound, nothing short of the very best available method should be applied; inasmuch as it so frequently happens with rapid methods, they give inaccurate reactions, and leave the worker in doubt. For example: Gutzeit's test is evidently superior in point of delicacy to even Marsh's or Reinsch's, but depending on the formation of a yellow compound, by the action of arsine on mercuric chloride or acidulated silver nitrate solution, the results are ambiguous, because of the fact that very minute traces of hydrogen sulphide or phosphine produce a stain similar to the one produced by arsenuretted hydrogen, and there is no means of distinguishing between them.

It is the experience of chemists in general that the Marsh test modified by Berzelius and the Reinsch method are the most reliable, some being in favor of one method and others in favor of the other. After considering the various methods in detail and making some experiments with the same, it was decided to compare Bettendorff's methods with the two above.

Before attempting to apply the tests, it is important to ascertain whether the chemicals and every part of the apparatus to be employed are relatively free from arsenic or other interfering agents. The word "relatively" is used because chemists realize that it is practically impossible to obtain many articles at present, absolutely free from arsenic.

There is always more or less trouble with the metallic zinc to be em-

* 1842, Journ. de Pharm., 2, 362.

† 1851, Ann. (Liebig), 72, 126.

‡ 1869, Ztsch. für Chemie, 12, 492; Wittstein's Vierteljahrsche, 1870, 430.

§ 1879, Pharm. Ztg., page 263.

ployed in the Marsh-Berzelius method. The Joint Arsenic Committee of the Societies of Chemical Industry and Public Analysts,* in connection with the preparation of standard mirrors, states: "It is important to note that some 'pure' zinc is from a cause at present unknown, not sufficiently sensitive; that is to say, the addition of minute quantities of arsenic produces no mirror." Various methods have been suggested for overcoming this difficulty. For example: platinum chloride is added; A. H. Allen† recommends that a trace of iron be always present. W. Thompson‡ uses copper sulphate and says nickel is better. O. Hehner§ claims that platinum chloride makes the reaction less delicate. Headden and Sadler|| get much lower results on the addition of copper sulphate or platinum chloride. Investigations are needed along this line.

The zinc employed in this work was prepared electrolytically, and a careful test of the same showed that it was free from arsenic, but contained a minute trace of iron; the latter probably coming from the vessels in which the zinc was molten for granulation. The influence of iron on arsenic will be discussed under the iron compounds. O. Hehner prepares¶ arsenic-free zinc as follows: Melt ordinary block zinc in a clay crucible, when quite fluid add for each pound of zinc about one gram of metallic sodium, and stir well with a glass rod. A black scum forms immediately. Remove scum from time to time as formed, by means of china spoon or crucible cover held in tongs. When the metallic sodium appears to be oxidized, add more sodium, again stir vigorously and remove scum formed. The above operation takes about ten minutes. Now pour the molten zinc into a second clean clay crucible, and treat with metallic sodium as above; finally allow the molten metal to cool considerably, then granulate in the usual way.

It is not so very difficult to obtain sulphuric acid comparatively free from arsenic; but the first sample secured contained quite an appreciable quantity of the arsenic. A second sample proved to be very good. For testing the acid, 30 Cc. were diluted to 150 Cc. and poured through a separatory funnel, a little at a time, so that the evolution of gas could be regulated. There appeared within fifteen minutes after the hydrogen current became uniform, a very faint yellowish-brown spot in the constriction of the tube. This did not increase even after one hour of continuous evolution of the gas. The spot was probably due to a mixture of sulphur and arsenic. Inasmuch as only 12 Cc. of the sulphuric acid were

* 1902, Jour. Soc. Chem. Ind., 21, 95.

† 1901, Jour. Soc. Chem. Ind., 21, 94.

‡ 1902, British Food Jour., 4, 193; Chem. News, 86, 179.

§ 1901, Jour. Soc. Chem. Ind., 20, 194.

|| 1885, Amer. Chem. Jour., 7, 341.

¶ 1902, Jour. Soc. Chem. Ind., 21, 675.

employed for each subsequent operation, and the apparatus was tested in each case for thirty minutes before introducing the material to be tested, this small coloration could be entirely neglected. As a matter of fact, 12 Cc. of the concentrated sulphuric acid, diluted, did not produce a coloration sufficient to be seen with the naked eye.

No hydrochloric acid could be obtained that was free from arsenic. It was, however, prepared by distilling the purest obtainable article with ferrous chloride, rejecting the first tenth that came over. This procedure gave an acid which was free from arsenic when tested thoroughly with the three methods used.

The tin and copper foils, as well as the calcium chloride, were examined and found to be free from arsenic.

The Marsh-Berzelius apparatus consisted of a 200 Cc. Erlenmeyer flask, provided with a double perforated rubber stopple, carrying a 50 Cc. separatory funnel and an exit tube, which was connected with a straight, bulbed, calcium chloride tube, the latter being nearly filled with pure anhydrous calcium chloride. At the end of the calcium chloride tube, toward the Marsh tube, there was placed a wad of cotton so as to prevent a flashing back of the flame into the apparatus and thus avoid explosions. The separatory funnel was employed because the amounts to be used could be carefully regulated, and the danger of introducing air was eliminated.

The hard glass Marsh tubes (free from arsenic, lead and antimony) were drawn out with two constrictions of the conventional diameter, and the far end was also drawn out fine and fused so as to leave only a small orifice. This precaution prevented any farther fusion of the glass by the burning hydrogen.

About 25 grams of zinc and 60 Cc. (1 to 5) of sulphuric acid were used for each operation. That is, the apparatus was thoroughly cleaned each time a new test was made.

Bettendorff's reagent was made by dissolving pure tin foil in concentrated hydrochloric acid, the tin was added until the solution was thoroughly saturated. In applying this reagent all solutions were highly acidulated with hydrochloric acid.

Reinsch's method was applied in the usual way, no special precautions being necessary, except when organic matter was present or other interfering agents were indicated.

A careful comparison of these methods with known material gave the following results :

Number.	Mg. of As_2O_3 .	Grains As_2O_3 .	Marsh-Berzelius.	Reinsch's.	Bettendorff's.
1	1.0	$1/65=0.0154$	Color black immediately.	Foil black almost instantly. Crystals many and large.	Considerably less gave a decided reaction.
2	0.5	$1/129=0.0077$	Do.	Do.	Do.
3	0.25	$1/260=0.00385$	Do.	Foil dark gray. Crystals large and many.	Tin foil and solution colored within two minutes. Bad in 15 minutes.
4	0.125	$1/520=0.00192$	Color lighter black in 2 minutes than No. 3.	Do.	Not so intense a coloration as No. 3.
5	0.0625	$1/1037=0.00096$	Color lighter black in 5 minutes than No. 3.	Foil much colored, crystals plain.	Solution and tin show coloration within 15 minutes.
6	0.03125	$1/2074=0.00048$	Color lighter than No. 5. Time 7 minutes.	Foil assumes dark purple color, crystals plain.	Color did not show up within 15 minutes. After 25 minutes, slight coloration of tin foil.
7	0.01562	$1/4149=0.00024$	Color lighter than No. 6. Time 10 minutes.	Foil slightly colored purple. Crystals plain.	After an hour there seemed to be a slight coloration.
8	0.00781	$1/8298=0.00012$	Stain quite marked in half hour.	Foil but little colored. Crystals plain.	Results negative.
9	0.00390	$1/16596=0.00006$	Stain less marked than No. 8.	Foil very slightly colored. Very few crystals.	Do.
10	0.00195	$1/33333=0.00003$	Stain faint in half hour.	Slight stain. No crystals.	Do.
11	0.00129	$1/50000=0.00002$	Stain very faint in half hour.	Slight stain.	Do.

These figures are only approximately equivalent.

According to the above results the limit of the Bettendorff test is about $\frac{1}{80}$ Mg. or $\frac{1}{2000}$ of a grain of arsenous oxide per Cc. of solution or gram of material.

The limit of the Reinsch's method is reached at about $\frac{1}{200}$ of a Mg. or $\frac{1}{17000}$ of a grain of arsenous oxide in one Cc. of solution or one gram of material.

The limit of the Marsh-Berzelius test is reached at about $\frac{1}{500}$ of a Mg. or $\frac{1}{88888}$ of a grain of arsenous acid per Cc. of solution or gram of material.

It is claimed by some observers that the $\frac{1}{1000}$ of a Mg. per Cc. of liquid gives positive indications; but some of the more conservative are of the opinion that $\frac{1}{100}$ of a Mg. per Cc. of fluid is about the limit. The evidence of the presence of $\frac{1}{800}$ of a Mg. of arsenous oxide per gram of material obtained by the writer, is not at all positive, and he is of the opinion that

considerably more must be present before the chemist can make a positive statement; $\frac{1}{10}$ of a Mg. is, however, a little too conservative, because with this amount the tube becomes almost black throughout the constriction.

It was decided to make standard tubes or mirrors for the Marsh-Berzelius test, by depositing the metallic arsenic in the tubes and using them for comparison in deciding as to how much arsenic a given substance contained. This was decided on, because it was soon found after a little work was done, that it was practically impossible to weigh the small quantities of arsenic generally obtained.

The figures given above represent the amount of arsenous acid contained in one or more Cc. of solution of known strength. The solutions were consecutively so diluted that the writer was in a position to know just how much arsenic was added in each operation, and carried to such an attenuation that only the minutest coloration was developed in the reactions.

On comparing the above results with those obtained by other observers, it can be readily seen that the Marsh-Berzelius test did not appear to be as delicate as frequently represented. The writer thinks, however, that this is chiefly due to the fact that with few exceptions experimenters have given the degree of dilution of the solution, without mentioning the quantity employed. The point made by the late Dr. Wormley* in this connection is well worth repeating. He says: "Thus it has been stated that the method (Marsh) will yield satisfactory deposits when the solution contains only $\frac{1}{200000}$ th of its weight of arsenic. This is true, but it requires about 1000 grains of such a solution to furnish these results; the absolute quantity of oxide present, would therefore be about $\frac{1}{2000}$ th of a grain."

In preparing the standard tubes it is desirable to make two or more so as to be certain that the tubes are alike and uniformity exists in the operation. It is possible that the standard tubes of one worker will vary slightly from those of another; but this will not materially affect results if details are observed. The tubes must be prepared from the zinc and reagents subsequently to be employed for the work. How long the tubes will be reliable time only can tell. Those in the writer's possession, made over a year ago, and carefully sealed, show by comparison with new tubes, not to have changed in the least.

After making a careful study of the above three methods, both as to reliability and ease of execution, it was decided to employ Marsh-Berzelius throughout. This process is frequently decided against as being too difficult of operation. Such an objection is probably justified, but it is the writer's experience that when pure reagents are at hand, and the apparatus is once set up, the results are obtained with less care and trouble than by any other method.

* 1885, Micro-Chemistry of Poisons, 2d Ed., page 285.

It is always wise to make two mirrors—one for comparison with the standard and the other for the production of octahedral crystals of arsenous oxide. This precaution is essential to eliminate the possible presence of such disturbing impurities as antimony, mercury, and selenium.

When comparatively large quantities of antimony are heated, the resulting sublimate may contain octahedral crystals.*

Selenium and Tellurium have been discussed by A. E. Berry† and O. Rosenheim.‡ Tellurium probably has no influence on the Marsh-Berzelius test, but there seems to be much uncertainty at present about the influence exerted by the selenium. The disturbing influence of this element can be eliminated like the sulphur compounds, by placing a wad of cotton moistened with lead acetate in the fore part of the calcium chloride tube.

The arsenical deposit occurs from 1 to 2 Cm. back of the flame, which is so placed that the greater portion of the mirror is in the constriction of the tube. When the deposit is small, a fine brownish mirror results, but large deposits are arranged in three rings. The ring toward the flame is brown and semi-transparent. The middle portion is dense and almost black, while the outer portion is grayish and diffusing. The character and formation of the mirrors are influenced by certain elements like antimony, mercury and selenium.

As above stated, the hydrogen was allowed to evolve slowly and pass through the apparatus for thirty minutes, before the substance to be tested was introduced. The flame during this time was placed just before the outer constriction; and if any arsenic could possibly have been present in any portion of the zinc, sulphuric acid, etc., it would have been revealed by this precaution. The test, however, was invariably negative. The flame was then placed just before the inner constriction and the substance or solution of the substance to be tested introduced into the flask, little by little, through the separatory funnel. It is generally necessary to add the substance to be tested slowly, because the presence of arsenic appears to augment the reaction very materially. In most cases where arsenic was present, it was revealed in from five to eight minutes; and all seemed to have been evolved in from fifteen to twenty minutes. The test, however, was uniformly continued for thirty minutes. In a few doubtful cases the hydrogen was permitted to be generated for one hour. It was considered that a longer time than this was absolutely unnecessary, inasmuch as chemists realize that if large enough quantities are taken, and the reaction allowed to continue sufficiently long, a trace of arsenic can be obtained from almost all substances. With these precautions, a number of chemicals and allied products were examined with the following results:

* Wormley, 1877, *Am. Jour. Med. Science*, 399.

† 1901, *Jour. Soc. Chem. Ind.*, 20, 322.

‡ 1901, *Chem. News*, 83, 280.

GLYCERIN.

Quality.	Amt. used.	Amt. of arsenous oxide	
		in grains.	in Mg.
Glycerin, pure.....	20 Gms.	$\frac{1}{8}$	1
Glycerin, pure.....	20 Gms.	$16\frac{1}{2}$	$2\frac{1}{5}$
Glycerin, guaranteed arsenic free..	20 Gms.	$20\frac{1}{4}$	$\frac{1}{30}$
Glycerin, very pure.....	20 Gms.	$3\frac{1}{2}$	$\frac{1}{8}$
Glycerin, pure.....	20 Gms.	$33\frac{1}{3}$	$1\frac{1}{11}$
Glycerin, crude	20 Gms.	$3\frac{1}{2}$ to $10\frac{1}{8}$	$\frac{1}{8}$ to $1\frac{1}{8}$

The application of the Marsh-Berzelius test to glycerin gave very good results, and worked admirably. The amount of arsenic in the first one was certainly abnormally high.

SODIUM PHOSPHATE.

Quality.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
1. Sodium phosphate, pure, med....	5 Gms.	$41\frac{1}{4}$	$\frac{1}{8}$
2. Sodium phosphate, pure, med....	5 Gms.	$20\frac{1}{4}$	$\frac{1}{30}$
3. Sodium phosphate, pure, med....	5 Gms.	$10\frac{1}{8}$	$1\frac{1}{8}$
4. Sodium phosphate, American....	5 Gms.	None.	None.
5. Sodium phosphate, imported	5 Gms.	$\frac{1}{8}$	1
6. Sodium phosphate, American....	5 Gms.	None.	None.

From the above results, it can readily be seen that the greater amount of sodium phosphate contained arsenic. The two American products were of very good quality. In this connection it might be well to state that the mirror was somewhat slow in developing. This was probably due to the condition of the arsenic. Without doubt, it was present in the "ic" form.

BISMUTH AND BISMUTH SALTS.

Kind.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Bismuth, metallic.....	10 Gms.	$18\frac{1}{2}$	$2\frac{1}{8}$
Bismuth, subcarbonate	10 Gms.	$41\frac{1}{4}$	$\frac{1}{8}$
Bismuth, subnitrate	10 Gms.	$33\frac{1}{3}$	$3\frac{1}{3}$

All the bismuth products were converted into chlorides. The reason why we have more arsenic in the bismuth subcarbonate than in the metal is because some of the agents employed in the manufacture of the former contained traces of arsenic. It is very important that the bismuth subnitrate be free from arsenic, if possible, inasmuch as this article is frequently given in large and continued doses and is liable to lead to undesirable results. The salt has frequently been examined,* and almost always found to contain a trace of arsenic. So far as recorded results indicate, no fatal poisoning has ever resulted from arsenical bismuth subnitrate.

* 1868, Chem. News, 16, 260; 1882, Amer. Chem. Jour., 3, 396.

COPPER SALTS.

Kind.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Copper sulphate, commercial	5 Gms.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Copper sulphate, recrystallized	5 Gms.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Copper carbonate, basic	5 Gms.	$\frac{1}{2}$	2.3

There seems to be considerable difference of opinion as to the possibility of recovering arsenic from copper preparations by means of the Marsh-Berzelius method. Some claim that the arsenic will not be evolved, others claim that the evolution of the arsenic is facilitated. The above results were obtained by adding the dissolved copper salts directly to the generator as was done in testing other compounds. It is interesting to note that the copper carbonate made from copper sulphate and sodium carbonate, apparently carried all the arsenic with it, inasmuch as the resulting sodium sulphate was free from arsenic.

ORGANIC ACIDS.

Kind.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Acetic acid	30 Cc.	None.	None.
Citric acid	10 Gms.	None.	None.
Lactic acid	80 Cc.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Tartaric acid	10 Gms.	None.	None.

The above acids worked very nicely with the ordinary apparatus, no special precautions being necessary.

INORGANIC ACIDS.

Kind.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Sulphuric acid, distilled	30 Cc.	Very slight trace.	
Sulphuric acid, C. P.	30 Cc.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Sulphuric acid, commercial	30 Cc.	Very large amount.	
Nitric acid, C. P.	25 Cc.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Nitric acid, Commercial	25 Cc.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Hydrochloric acid, C. P.	30 Cc.	Very slight trace.	
Hydrochloric acid, commercial	30 Cc.	$\frac{1}{8}\frac{1}{2}$	$\frac{1}{2}$
Phosphoric acid	5 Gms.	None.	None.

The nitric acid was treated with sulphuric acid, gradually evaporating the latter and in this way retaining the arsenic.

It was found that there was practically no difference in the uniformity of action in the generator between hydrochloric and sulphuric acid. There did not seem to be any difference between the mirrors produced by these two acids with the same material.

IRON SALTS.

Kind.	Amt. used.	Amt. of arsenous oxide	
		in grains.	in Mg.
Iron, metallic, card teeth.....	5 Gms.	$\frac{1}{1037}$	$\frac{1}{18}$
Iron, by hydrogen.....	5 Gms.	None.	None.
Iron chloride, solution	50 Gms.	None.	None.
Iron chloride, crystals.....	5 Gms.	None.	None.
Iron and Ammonium citrate	5 Gms.	None.	None.
Iron sulphate, crystals	5 Gms.	None.	None.

Iron in all forms seems to be a disturber in the estimation of arsenic by the Marsh-Berzelius method. It seems that the iron in some way holds back the arsenic. This was pointed out as early as 1839 by Wöhler,* who found that the arsenic contained in pig iron did not pass off when the iron was dissolved in sulphuric acid. The amount of arsenic indicated to be present in the card teeth was probably an amount in excess of that which the iron was capable of holding under the conditions. The ferric chloride solution was made from the same card teeth, and the probable reason for the absence of any indicated arsenic is that the arsenic, in part at least, was evolved as arsine, while the card teeth were dissolved in hydrochloric acid. In this connection see results recorded by Wormley.† No special search was made for the presence of arsenic in these iron preparations by any other test.

SODIUM SALTS.

Kind.	Amt. used.	Amt. of arsenous oxide	
		in grains.	in Mg.
Soda ash.....	5 Gms.	None.	None.
Sodium borate.....	10 Gms.	None.	None.
Sodium carbonate, crystals	5 Gms.	None.	None.
Sodium hydrate, commercial.....	5 Gms.	$\frac{1}{528}$	$\frac{1}{8}$
Sodium pyrophosphate.....	5 Gms.	Small yellow stain.	
Sodium bromide.....	5 Gms.	$\frac{1}{4148}$	$\frac{1}{8}$

The sodium hydrate and carbonates were neutralized with sulphuric acid before being introduced into the generator.

POTASSIUM SALTS.

Kind.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Potassium bicarbonate	5 Gms.	None.	None.
Potassium carbonate.....	5 Gms.	$\frac{1}{4148}$	$\frac{1}{8}$
Potassium bromide	5 Gms.	$\frac{1}{4148}$	$\frac{1}{8}$
Potassium hydrate, electrolytic	5 Gms.	None.	None.
Potassium hydrate, sticks	5 Gms.	$\frac{1}{1037}$	$\frac{1}{18}$

The alkaline products were neutralized with sulphuric acid before being used.

* 1839, Ann. (Liebig), 31, 95.

† Micro-Chemistry of Poisons, 2nd edition, page 316.

GLUCOSE.

Kind.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Glucose	10 Gms.	None.	None.
Glucose	10 Gms.	None.	None.
Glucose	10 Gms.	None.	None.

The three samples of glucose were all of the same brand. It appeared to be impossible to get any other variety. The samples all contained sulphites, sulphates, and calcium. The sulphites were destroyed by the addition of bromine, the excess being driven off by boiling the solution.

MISCELLANEOUS.

Substance.	Amt. used.	Amt. arsenous oxide	
		in grains.	in Mg.
Ammonium chloride.....	5 Gms.	$\frac{1}{3333}$	$\frac{1}{311}$
Bromine	5 Gms.	None.	None.
Honey	5 Gms.	None.	None.
Magnesium sulphate, cryst.....	10 Gms.	None.	None.
Tobacco	15 Gms. (about)	$\frac{1}{2074}$	$\frac{1}{30}$
Zinc sulphate, dried	5 Gms.	None.	None.

The bromine was converted into a bromide before being introduced into the generator. For a while the presence of arsenic in tobacco seemed somewhat mysterious. It was suggested that it probably came from the use of an arsenical fertilizer; but it subsequently developed that the tobacco had been sprinkled with arsenical preparations to prevent the destruction of the plant by insects.

This investigation clearly shows that a large number of chemicals contain arsenic, and it may be only a question of amount whether all chemicals do not contain more or less of this impurity. A number of recent investigations seem to indicate that even normal animal tissues contain traces of arsenic.

The above results were in hand over a year ago, and the conclusions arrived at are strikingly in accord with the report of the Joint Arsenic Committee of the Society of Chemical Industry and Public Analysts.

In order that the reader may get a comprehensive view of the agitation of arsenic during the past two years, it would be well for him to read the interesting discussions, methods of testing for the presence of arsenic, and estimation of the same, contained in the following literature: Jour. Soc. Chem. Ind., 20, pages 188, 193, 204, 332, 644 and 1033. Good abstracts will also be found in Proc. Amer. Pharm. Assoc., 49, pages 788 to 801.

Philadelphia, Pa., August, 1902.

EXAMINATION OF MILK.

BY MAYBELLE HAYDOCK, P. D.

We have always been taught to look upon milk as a food, and in infancy

and convalescence it is the only food that can be assimilated ; in reality it is the "food of life," and for this all important reason we should have a perfectly pure milk, and yet how little attention is paid to this fact. Mothers will feed their children upon any kind of milk, they will not make an effort to obtain the best milk, nor do they even take the trouble to sterilize it, before the child takes it. In this way we can readily account for a great many of the summer complaints in children and also the poor health of many of the adults. Not that I mean a mother will wilfully feed poor milk to the children, but that it is done without thought and in a great many cases through ignorance.

At no time during the year does the Pure Food Act find it more necessary to insist upon its laws than in the summer and especially with regard to milk. We all know how important it is to have an absolutely pure milk, and at the same time how repulsive it is if it is not "just right."

As you know, a normal milk contains : 87.50 per cent. water, 11.03 per cent. sugar, 3.50 per cent. fats, 4.70 per cent. proteids, .70 per cent. salts, and not more than 100,000 bacteria per cubic centimeter.

Last summer I examined two hundred samples of milk, both chemically and bacteriologically, and the latter examination was the most interesting. It readily showed whether the farmer had been careful or careless. It is a well-known fact that sometimes farmers and dairymen are not as clean as they might be about their work, and for their carelessness we have to pay the penalty in disease and also the cost.

While milk is considered of a good quality if it contains 100,000 bacteria per Cc., if intelligent care is exercised the bacteria can be reduced to 10,000 per Cc. It is best to adopt as a maximum 50,000 per Cc. Twelve samples out of thirty-six samples were so filled with bacteria that it was impossible to count them. The number of bacteria per Cc. is counted the same as in water.

SOURCES OF CONTAMINATION.

Milk when it is first drawn is perfectly sterile, and if thoroughly and quickly cooled, and bottled at once, will remain so for seventy-eight hours. If after bottling it is kept as "milk-ice," or with "milk-ice," it will keep even longer.

While milk is sterile while in the udder and when first drawn, it is also at the proper temperature to be a perfect hot-bed for germs if not properly handled.

Milk's first access to germ life is upon the farm, and in the factory the opportunities for infection are present in greater or lesser degree. It must, however, be remembered that the greater part of the organisms are relatively harmless. While they are not concerned in the direct production of disease, the larger majority of them affect, more or less seriously, the quality of the milk.

The general sources of infection are unclean dairy utensils, fore milk, coat of animals, unclean and careless attendants or milkers.

Dairy Utensils.—Of the greatest importance are the vessels that are used during milking. The actual visible dirt is not the greatest danger. It is the dirt, the unseen dirt, that packs itself into the creases and seams of the vessels, and unless cleansed with the greatest possible care, these cracks and joints are filled with foul and decomposing material to abundantly seed the milk. Soxhlet found that the addition of 0.1 per cent. of sour milk to fresh milk decreased the keeping quality of the milk from 15 to 30 per cent., the addition of 1.5 per cent. diminished it to 80 per cent.

The cans for transportation are frequently not washed until ready for the next milking, which makes a very favorable condition for rapid fermentation; then instead of being thoroughly cleansed they are often rinsed with questionable water. A number of epidemics of typhoid fever have been traced to this source.

The fore milk should always be rejected, as this is held in such a manner as to be exposed to the general contamination.

As is well known, cows do not always select for their resting places the cleanest parts of the pastures; this necessitates currying the cow, which is not done except in sanitary dairies.

INFECTION THROUGH THE MILKER.

When the time comes for milking it is seldom that the farmer will change his clothing or wash his hands; he leaves his work and will go immediately into the milking room, and often there is not even a milking room. At times the women folks attend to the milking. Perhaps there is illness in the family, and as has been proven, contagious diseases. They leave the sick room and will at once begin milking; one can readily see the source of many diseases in this way.

In Denmark and Germany, where there are a great many foot and mouth diseases, as well as tuberculosis, they compel all the milk to be boiled that is rejected, and sent back to the farm.

Storck has devised a test whereby it can be determined whether this treatment has been carried out or not. Milk contains a soluble enzyme known as galactose, which has the property of decomposing hydrogen peroxide. If milk is heated to 80° C. (176° F.) or above, this enzyme is destroyed so that the above reaction no longer takes place. If potassium iodide and starch are added to unheated milk and the same treated with hydrogen peroxide, the decomposition of the latter agent releases the oxygen, which acts on the potassium iodide, which in turn gives off free iodine that turns the starch blue (Russell, *Outlines of Dairy Bacteriology*).

The stable is frequently poorly ventilated and lighted, and not even drained. Sometimes the stable is not cleaned but once a week, and in other cases even a longer time.

Another source of contamination is the place where the cow waters. This matter is seldom even thought of by the farmer. Cows water at stagnate pools, and such waters are the greatest source of typhoid fever; and I have seen cows that have been driven from these pools and milked immediately, and not even the udders were washed. Not only is this the case with stagnate pools, but other creeks that run through the pastures that carry off the refuse and waste of the farm.

The question as to whether bovine tuberculosis can be transferred does not seem to be settled. But I do know, for I have tried it, that if you take an infected cow, isolate it, feed its milk to chickens, rabbits, pigs and rats, they will all sicken and die in a very little while. This is not only true of bovine tuberculosis, but also of other diseases.

To insure a perfectly pure milk, the stable should be well drained, so that the refuse will not go into the sewer, nor into any stagnant pool. It should be well lighted, so light that any one could read without hurting one's eyes, and as well ventilated as any living room, and even better than some.

The milker should wear a white suit, so that it will soil easily and be washed often, his hands and nails thoroughly cleaned, the cow curried by another man in the outer stable, the udders well scrubbed and rinsed. The milker's hands are then rubbed with vaseline, so that the milk is not held in them. The first milk is rejected; the rest is collected in sterile kettles. It is now ready to be transferred to the cooler, to be thoroughly and quickly cooled. The milk cans can then be sent on a long journey and be perfectly sweet and clean when the cans are opened. It is reported that London receives sweet milk from Denmark and Sweden which has been treated in this way.

If, after the cans have been opened and the milk is left exposed, it should then be questionable, the best plan is to pasteurize the milk.

Some dairymen pasteurize the milk after it has been cooled; others pasteurize instead of the ice or cooling method. The iced method, however, is the best. Milk that has been pasteurized has been kept for fourteen days at 48° F. and then considered commercially pure milk. The trouble with pasteurizing is to heat it at the proper temperature, which is from 158–161° F. If, however, it goes above 167° F., it is cooked, and therefore spoiled, as cooked milk has a bitter taste—so bitter sometimes that patients cannot drink it. The cause of this bitterness is not fully understood.

Pasteurized and boiled milk can be detected in milk by a weak solution of hydrogen peroxide and paraphenylenediamine solution, which gives a violet color. Just how much diluted, condensed milk can be added without detection has not been determined.

Gelatin is sometimes added to watered milk. This can be detected by mixing the suspected milk with warm water, adding acetic acid, filtering, adding tannin solution, when a copious precipitate will come down.

Cane sugar is detected by the rose color produced by boiling with resorcin and hydrochloric acid.

Excess of salt is detected with silver nitrate and potassium chromate, either in the milk after clarifying with milk of alumina or in the ash.

Added water may be determined by the blue color of the milk after the cream has risen, especially if it has risen quickly. Bicarbonate of soda is added to retard the rising of the cream, so as to prevent the detection of added water. Acetic and nitric acids with the whey test will detect added water.

The principal coloring matters are annatto, caramel and aniline dyes.

To detect coloring matters, add a small quantity of 25 per cent. acetic acid, allow to stand, decant off the whey, transfer the curd to a flask and cover with ether for an hour. Evaporate the ether, wash with water and sodium hydrate solution, filter. Treat dried filter with stannous chloride; if annatto is present, a pink color will be produced. After washing with ether, if the curd is still white, it is proven that neither caramel nor aniline-orange is present. But if caramel is present the curd will be of a pinkish color; if due to aniline, yellow or orange tint.

Carbonate of soda is added to disguise the acidity of sour milk. Acidity of milk is due to the production of "*Bacillus Acidi Lactici*," while the alkalinity is due to the fermentation of the proteids through the growth of micro-organism. It is the alkaline fermentation that is the most dangerous, on account of the formation of ammonia gas and the intermediate nitrogenous products, some being of a poisonous character.

Chemical preservatives are sold under all kinds of fancy names. "Preservin" is the ordinary boric acid. Salicylic and benzoic acids, formaldehyde and sometimes potassium chromate are used. The latter gives a faint yellow tint.

There have been a great many discussions lately as to the preservative powers of formaldehyde. But its use is not furthered owing to the great danger that is the outcome of its use, for it practically renders insoluble all albuminous matter, and its toxic effect is greatly increased in larger doses.

Aniline-red that has had its color discharged with sulphurous acid will detect the formalin by the color test. Sulphuric acid that contains a trace of ferric chloride will produce a violet color.

To 10 Cc. of milk, add 1 Cc. of fuschine sulphurous acid and allow to stand, when a pink color will be produced, even though formalin is absent. Add 2 Cc. dilute hydrochloric acid, and shake. If "formalin" is present a violet color is produced, if absent a yellow-white color is seen. This test will detect one part in 20,000 parts of milk. If applied to the distillate from the milk, will show one part in 500,000 parts.

My object is not to disgust you with milk but to have you enough interested in this life-giving substance to assist all you can in securing a beau-

tiful, delicious glass of milk. Is there anything more delicious if it is properly taken care of and is "just off the ice" when you are hungry and thirsty, except one article that is even more delicious, because it is frozen and flavored, and that is Philadelphia ice cream?

(The tests mentioned in this paper are taken from the State laws.)

CONTRIBUTIONS TO THE PHARMACOLOGY OF NARCOTINE.

BY A. C. CRAWFORD, M. D. AND A. R. L. DOHME, PH. D.

The opinions as to the physiological activity of narcotine have varied widely. It was considered by its discoverer, Derosne, to be the active principle of opium—whence its name, but recently Palmer has suggested the name anarcotine from its lack of narcotic properties. The reports of the earlier experimental work vary widely, no doubt owing to imperfect methods of isolation. Von Schroeder considers their perusal worth very little, owing to the lack of details as to the purity of the narcotine used. The historical details which follow have been taken from his work (*Archiv f. exp. Path.* v. 17, 1883, p. 100).

The first to study the action of narcotine on animals was Orfila (*Lehr. d. Toxikol.*, 1853). He claimed that the character of the action depended largely upon the solvent; thus dissolved in olive oil, 0.4–0.6 Gm. first accelerated the respiration (dog), then produced a condition of stupor which was followed by death—slight convulsive movements of the limbs preceded death. A dose of 1.3 Gm. dissolved in dilute acetic acid accelerated the respiration, and caused severe convulsions, followed by stupor and death, while 2 Gm. dissolved in hydrochloric or nitric acid produced no toxic symptoms.

Magendie believed it to be the excitant principle of opium, as, after the administration of 0.03 Gm., he experienced some excitation and headache, and dogs under its influence had convulsive movements.

Small doses, according to Bailly (*Rev. med.*, 1825), are inactive in man, while large ones, 3–3.5 Gm. induce merely headache and slight nausea; after a dose of 7 Gm., one of his cases merely experienced slight giddiness.

Charvet (*Die Wirkung des Opiums*, 1827) found that narcotine caused only slight acceleration of his pulse. He claimed the administration of 1 Gm. to rabbits was followed by slight trembling and increase in reflex excitability, later by death.

Cogswell (*Lancet*, 1852) saw no action in frogs from 0.1 Gm., while Albers (*Arch. f. path. Anat.*, v. 26, p. 225) claimed that the injection of 0.05–0.1 Gm. as powder into frogs caused numbing of sensation and narcosis, and recommended its clinical use in cases of abnormal sensibility.

Bernard (*Compt. rend.*, v. 59, p. 406) denied any narcotic action.

Schroff (*Pharmakologie*, 1856, p. 476) noted in man that the adminis-

tration of 0.1 Gm. caused slight rise in pulse rate, followed by a fall, accompanied by dilatation of the pupil, deepening of the respiration, and sleepiness; the action was transitory.

Baxt (*Arch. f. Anat. u. Physiol.*, 1869, p. 112) claimed that 0.1 Gm., used subcutaneously in rabbits and guinea-pigs, was inactive, while 0.02–0.04 Gm. in frogs induced a comatose condition which was followed by convulsions.

Eulenburg (*Hypoderm. Injection d. Arzneimittel*, 1875) noted an acceleration in pulse rate (man) and in respiratory frequency, with a rise in temperature. He believed there was very slight, if any, hypnotic action.

Barbier's reports (*Traité de Mat. Med.*) differ very much from those from the use of pure narcotine.

We undertook this study in the hope of obtaining data to form conclusions as to the advisability of denarcotizing opium, a question now under discussion by the Committee on Revision of the United States Pharmacopœia. Warm-blooded animals were especially used because of their closer relationship to man, and in all experiments involving pain, the animals were anæsthetized with acetone-chloroform, urethane or ether.

We used, at first, narcotine isolated by the method described in Schmidt's *Pharmaceutische Chemie*, 3rd ed., v. 2, p. 1394, but most of the work was done with Narcotine pure, of Merck—this they declare to be "perfectly pure." Neither gave the morphine reaction with selenous acid dissolved in concentrated sulphuric acid, and the narcotine of Merck, which alone was tested, gave no blue violet color, showing the absence of papaverine (*Huseman-Liebig Annalen*, v. 128, p. 308). Melting point 176° C. (348.8° F.) (Vanderkleed).

GENERAL ACTION.

The administration of from 16 to 64 Mg. by mouth to one of us (weight 133 lbs), caused no appreciable disturbance, no drowsiness or change in temperature (before experiment 98.5° F., after experiment 98.4° F.), and did not produce constipation or any disturbance in pulse rate. Daily doses of from 0.12 to 0.8 Gm. have been used for migraine associated with malaria, and the only untoward symptom has been some weakening of the pulse (*Semaine med.* 1896, No. 14, quoted by Kunkel *Handb. d. Toxikol.* v. 2, p. 820). The usual dose for intermittent fever cases is given as from 1½ to 3 grains (*Roberts-Lancet*, v. 2, 1895, p. 306). See also *Brit. and Foreign Med. Review*, v. 8, 1839, p. 263.)

In small dogs (16–24 lbs.) the subcutaneous injection of 16 to 300 Mg. merely induces slight drowsiness, with acceleration of the respiration, while larger doses, 0.5 Gm., produce slightly more marked dullness and disinclination to move. In one case, some stiffening of the limbs and marked salivation; at times tremors and restlessness are seen, but in every

case, with one exception, the dogs would come to you on being called. Unlike morphine, it induces no vomiting or purgation in dogs.

A cat (8 lbs.) and a rooster (5 lbs.) were apparently unaffected by 64 Mg. hypodermically.

Rabbits were used by v. Schroeder. He found that 0.5 Gm. per os caused, in 15–20 minutes, slight trembling, with some restlessness; then followed for about $\frac{1}{2}$ to 1 hour a stage of increased reflex excitability; then a return to normal. The narcotic action was very slight and uncertain in appearing. After the administration of 1.2 Gm., the stage of excitement is succeeded by one of depression, in which paralytic symptoms appear, and death in about forty hours.

In frogs, the hypodermic injection of 0.05 to 0.07 Gm. produces a somewhat similar picture—first a stage of diminished, followed by one of increased reflex excitability, and later by paralysis (v. Schroeder). This paralysis is mainly central in origin, although the excitability of the motor nerves is diminished.

Pigeons, which are immune to morphine, die with convulsions from 0.15 Gm. narcotine (Liebreich-Encyc. d. Ther., v. 3, p. 204). So that in animals any narcotic effect is very slight and often uncertain.

The injection of narcotine powder under the skin in frogs is not followed by symptoms of narcotine poisoning, as it is practically unabsorbed in this condition (v. Schroeder). Its salts are very unstable, so that it should be used in weak hydrochloric acid solution. We used for most of the succeeding work a solution made by dissolving narcotine in $\text{HCl } \frac{N}{77}$ and controlling the experiment with $\text{HCl } \frac{N}{40}$, calculating that the difference in acidity of these solutions would be neutralized by the affinity of the narcotine. On this solution moulds grow if left long.

CIRCULATION.

The injection of 14.4 Mg. into the femoral vein of a dog (15 lbs.) under 21 Grs. acetone-chloroform, whose blood-pressure corresponded to 104 mm. Hg, caused a fall in ten seconds to 90 mm., reaching 51 mm. thirty seconds after the injection, and only returned to 80 mm. after six minutes. Control acid injections had no depressant action.

Before injection 104 mm. Hg.

After	"	100	"	"
"	"	104	"	"

In other cases, this fall in pressure is not as sudden. In one case in which the blood pressure corresponded to 119 mm. Hg. before injection of 14.4 Mg. narcotine, the readings every 10 seconds afterward were as follows:

116	106	87
113	96	90
112	91	85

If, however, the narcotine is injected into the cerebral end of the carotid artery, so that it is carried directly to the medullary centers, there is a rise in blood pressure, indicating a stimulation of the vaso-motor centers.

Dog under acetone chloroform and curare, with artificial respiration.

Blood pressure before injection 84 mm. Hg.

"	"	"	"	85	"	"
"	"	"	"	82	"	"
"	"	after	"	83	"	"
"	"	"	"	85	"	"
"	"	"	"	97	"	"
"	"	"	"	100	"	"
"	"	"	"	90	"	"

This fall from narcotine also occurs after section of the spinal cord between the second and third cervical vertebrae and division of the pneumogastric nerves, so that a part of the fall in pressure must be independent of the central nervous system.

Male dog 21 lbs. Acetone-chloroform 2 Gm.

Cervical cord and vagi cut. Artificial respiration.

Before injection, blood pressure * 48 mm. Hg.

"	"	"	"	50	"	"
"	"	"	"	52	"	"
"	"	"	"	50	"	"
"	"	"	"	52	"	"
"	"	"	"	49	"	"

After injection of 14.4 Mg. narcotine 49 mm. Hg.

"	"	"	"	"	"	46	"	"
"	"	"	"	"	"	45	"	"
"	"	"	"	"	"	45	"	"
"	"	"	"	"	"	46	"	"
"	"	"	"	"	"	40	"	"
"	"	"	"	"	"	42	"	"
"	"	"	"	"	"	39	"	"

Stimulation of the cardiac end of the vagus nerve still inhibits the heart so that the inhibitory fibres are unaffected.

The accelerator nerves are likewise unaffected.

Female dog, 25 lbs., 14.4 Mg. narcotine intravenously.

Pulse rate every 10 seconds 29.

"	"	"	25.
"	"	"	29.

Accelerator nerve was then stimulated for a few seconds 30.

"	"	"	"	"	"	31.
"	"	"	"	"	"	28.

Accelerator nerve was again stimulated for a few seconds 33.

"	"	"	"	"	"	31.
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* Observations taken every 10 seconds.

Stimulation of the central end of the sciatic nerve immediately after the injection of narcotine does not raise the blood pressure quite as high as before the injection of narcotine, but this soon passes off, and the center responds as usual, indicating that the vaso-motor center is little, if at all depressed.

A plyethysmographic tracing from foreleg of dog was negative.

The pulse rate is slowed.

Dog 15 lbs. Pulse 162 a minute.

" " 178 "

" " 160 "

After injection into vein of 17.2 Mg. narcotine, 162.

" " " " 152.

" " " " 148.

The cardiac tracings from frog, using the method of suspension by the apex, shows a marked slowing.

Summary : Narcotine injected into the veins causes a fall in blood pressure, with slowing of heart beat. This fall is probably mainly due to a direct action on the heart itself. Von Schroeder believes the slowing of the heart to be due to changes in the cardiac motor ganglia.

RESPIRATION.

The respiration after injection of narcotine is accelerated.

Dog 15 lbs., 21 grs. acetone-chloroform.

Before injection respirations every 10 seconds, 2.

" " " " " 3.

After injection respirations every 10 seconds, 4.

" " " " " 6.

" " " " " 5.

" " " " " 6.

" " " " " 7.

" " " " " 6.

This increase in respiratory frequency is well seen if the narcotine is injected directly toward the respiratory center, indicating a stimulation of this center, but the individual respirations become shallower. Thus, a rabbit 5 lbs. was narcotized with 2 Gm. urethane. The respirations were 38 per one-half minute, with a volume of 11.75 Cc., as measured by Dreser's method. After the intravenous injection of 17.2 Mg. narcotine, the respirations were 46.5 per one-half minute, while the volume was diminished to 8.65 Cc., so that it acts directly opposite to heroin. The volume of the respirations in dogs is not increased.

ALIMENTARY CANAL.

The *submaxillary* secretion (dogs), measured directly from canulae in the submaxillary ducts, is at once diminished by the intravenous injection

of 14.4 Mg., although stimulation of the chorda tympani again produces an active secretion; in the case of one dog in which 0.5 Gm. produced marked toxic symptoms, the saliva ran like after the use of pilocarpine.

The *biliary* secretion, as collected from a dog by means of a canula in the common bile duct, the cystic duct having been clamped off, was weighed every twenty minutes for two hours, but the weights remained practically the same before and after the injection of 43.2 Mg. narcotine in about one hour.

On the *intestines*, narcotine seems to exert a quieting effect. One dog, with diarrhoea, requiring her cage to be washed out several times a day, received 0.5 Gm. narcotine subcutaneously. She then had no stool for at least 30 to 36 hours after, and this was more solid than the previous one; the following 24 hours she had two, but during the succeeding 24 hours, merely one stool.

Balloons placed in the small intestine show no rise in pressure, indicating no increase in movements, but rather a lessening in pressure, therefore a relaxation.

These observations are in accordance with those of Leubuscher (Deut. Med. Woch., 1892, p. 181), who induced intestinal movements in rabbits by partially asphyxiating them. He found that the movements were less if narcotine had been administered previously to the asphyxiation.

Subcutaneous injections of 2 to 3 Mg. diminish intestinal peristalsis in frogs, and 3 to 5 Mg. cause intestinal tetanus, while even after 1 Mg. signs of over-excitability of the intestines develop late (Spitzer, W. Virchow's Archiv., v. 123, 1891, p. 612). We have seen no signs of this late excitability in dogs. In man, non-toxic doses are negative in their action on the intestines.

URINARY ORGANS.

The injection of 17.2 Mg. narcotine into the femoral vein (dog 15 lbs. anaesthetized with acetone-chloroform 21 Grs.) caused a diminution of from $5\frac{1}{2}$ drops urine in $\frac{1}{2}$ minute to $\frac{3}{4}$ of a drop, and this diminution was continuous until the end of the experiment twenty-four minutes later. Injection was repeated once during this time.

In a second case, 14.4 Mg. caused a diminution of from 11 drops per minute to $1\frac{1}{2}$ drops.

One dog of 15 lbs., which was secreting from 150 to 278 Cc. urine in twenty-four hours, after a subcutaneous injection of 0.5 Gm. secreted 185 Cc. in forty-eight hours, and of this none was passed until after thirty hours. Control acid injections cause no diminution. Sixty-four Mg. narcotine per os caused no diminution in urinary secretion.

Oncometer tracings of the kidney (dog) show a diminution in size of the kidney, but this returned to normal after the stimulation of the central end of the sciatic nerve.

ELIMINATION.

A small dog received 0.5 Gm. narcotine in weak HCl, subcutaneously. The stomach was then washed out three times in about four hours; these washings were evaporated at low temperature and after acidulating with weak H_2SO_4 shaken out with gasoline, benzol and chloroform, then made alkaline with ammonia, and re-shaken with these solvents in turn; the residue on evaporation of the alkaline benzol gave a good narcotine reaction with H_2SO_4 , showing that narcotine is partly eliminated by the stomach.

From the dog cited previously, the urine which was passed within forty-eight hours after the subcutaneous injection of 0.5 Gm. narcotine was also acidulated with weak H_2SO_4 and after concentration shaken out with benzol and chloroform, both in acid and alkaline condition. The alkaline benzol separation gave a fine narcotine reaction (H_2SO_4 1-5, then trace of HNO_3). The alkaline aqueous fluid was then shaken out with amyl alcohol. This left, on evaporation, a crystalline mass, which gave no reaction for morphine with Fröhde's reagent, and none for narceine with iodine water, so that there was no indication of any transformation of the narcotine in the body into these alkaloids.

The stools passed in about 36 hours after the injection were treated in the same way, but the alkaline benzol shaking gave no narcotine reaction with dilute H_2SO_4 , and the alkaline amyl alcohol shaking gave no Fröhde reaction for morphine, nor the reaction for narceine with iodine water.

Narcotine after subcutaneous injection is partly eliminated by the stomach and kidneys, but if eliminated at all by the bowel is so changed that it does not react with H_2SO_4 .

CONCLUSIONS.

In dogs, narcotine intravenously injected causes a fall in blood pressure, which is mainly due to a direct action on the heart itself. The pulse rate is slowed, and the cardiac nerves are unaffected. The narcotic action is slight. The respirations are increased in frequency, but the individual respirations are lessened in volume. The salivary secretion is at once stopped by small doses, but large doses may increase it. The amount of biliary secretion is uninfluenced. The intestinal movements are quieted. The renal secretion is diminished by its intravenous or subcutaneous use. Small doses per os are inactive. It is partly eliminated by the urine and stomach.

EFFECT ON MAN.

We have no reasons to believe that small doses of narcotine are injurious. Any unpleasant action the undenarcotized tincture of opium may have is probably due to other so-called odorous principles, and it does not re-enforce the action of morphine. We have found no evidence of the toxic effect claimed for narcotine by Ebert in his paper published this month.

Baltimore, Sept. 11th, 1902.

THE ACTIVE PRINCIPLE OF ERGOT.

BY A. R. L. DOHME, PH. D., AND A. C. CRAWFORD, M. D.

The controversy over the active principle of ergot is very old, and cannot be said at this writing to be in any more definite shape than it was years ago. The latest phase of the situation is that the picrosclerotine of Dragendorff, the ecboline of Tanret, and the cornutine of Kobert, are more or less impure forms of what Hager is pleased to prefer to name ergotinine, $C_{70}H_{40}N_4O_{12}$, and which Keller has preferred to call cornutine, although Hager considers these two identical. He also states that ergotinine is very readily decomposed, even citric acid in alcoholic solution converting it into the cornutine of Kobert. Ten per cent. of hydrochloric acid will do the same thing, and from this product ether will only remove but little unaltered ergotinine, while chloroform or ethyl acetate will remove remaining cornutine. Whatever alkaloid is present in ergot is there uncombined, and can be shaken out with ether. Hager says that the spasmotine or sphacelotoxine of Jacobi is not a homogenous body, but consists principally of sphacelinic acid together with some alkaloid. Although Jacobi claims therapeutic activity for his chrysotoxin $C_{21}H_{24}O_{10}$, an anthracene or phenanthrene derivative, secalinotoxin $C_{18}H_{24}N_2O_2$, an alkaloid, and sphacelinotoxin, a resin, especially for the last named, still Hager says a corroboration is necessary before this can be accepted. The balance of the evidence, according to Hager, points to the therapeutic activity being centered in Tanret's ergotinine, and its decomposition product, Kobert's cornutine. Kobert's sphacelinic acid, identical with Wigger's ergotin, is an acid poisonous resin, and the cause of ergotism, but not of ergot's therapeutic action. Holding rather to Keller than to Tanret or to Jacobi, we have always assayed ergot by the alkaloid obtained by his process of assay, and which he saw fit to name cornutine, and which we have always named the cornutine of Keller to distinguish it from Kobert's cornutine. Whether or not it is identical with Tanret's ergotinine, we are not prepared to prove, and we will accept Hager's claim that it is. We have for some years successfully assayed ergot and its preparations by Keller's method of assay, and we believe we can present some facts that will pharmacologically verify our view. The method consists of the following processes: The fluid extract is evaporated on a water-bath to remove the alcohol, and the residue is rubbed up with magnesia and water. This alkaline mixture is shaken for two hours with stronger ether, and the ether drawn off, and in turn shaken with weak solutions of hydrochloric acid. The acid solutions are made alkaline with ammonia and again shaken out with ether. The resulting ethereal solution is then evaporated in a tared Erlenmeyer flask and weighed. Whether or not this yields us absolutely pure cornutine does not especially concern us as long as we know that it represents all the therapeutic activity of the drug, and the alkaline mother-liquors from which it was extracted do not any longer

contain any such active principles. The points to be decided in our work are, (1) are the active principle or principles obtained as the product of our assay physiologically active in the sense of constricting the arterioles, and (2) is the mother-liquor of the fluid extract from which these were extracted devoid of such physiological activity?

Experiment I. Black rooster, weight 5 lbs. Before the injection the wattles and comb were red and warm. 5 Cc. fluid extract of best Spanish ergot were injected hypodermically at 10 a. m.

At 10:35 a. m., comb bluish but warm; wattles still red and warm.

At 11 a. m., comb and wattles blue and cooler.

At 11:40 a. m., comb and wattles very blue and much cooler.

At 3:30 p. m., comb and wattles still very blue and cool.

Rooster's bill open, and rooster looking quite sick. Conclusion: Fluid extract of ergot quite active.

Experiment II. The cornutine of Keller obtained from 5 Cc. of this same fluid extract was dissolved in weak acetic acid, and diluted so as to correspond in amount to the original fluid extract used. Injected 5 Cc. of this liquid at 10:35 a. m. hypodermically into the same rooster.

At 11:30 a. m., comb blue and cool all over, bill wide open, wattles bluish and cool.

At 12 m., comb much bluer and cool, wattles blue and cool.

At 1:30 p. m., comb deep blue and cool, wattles very blue and cool.

At 4:20 p. m., comb and wattles still both very blue all over and very cool.

Conclusion: the effect of the cornutine of Keller is identical with that of the fluid extract.

Experiment III. Filtrate obtained after removing all the cornutine by Keller's method of assay from 5 Cc. was neutralized, made up to 10 Cc., and injected hypodermically into the same rooster at 9:45 a. m.

At 10:48 a. m., slight bluing at the tips of the comb, wattles still red and both warm.

At 1:40 p. m., comb and wattles still warm, and both quite red.

Conclusion: the fluid extract except the cornutine of Keller does not cause vaso-constriction, and is hence not active physiologically.

Experiment IV. Gray and white rooster, weight 5 pounds. Injected hypodermically with 5 Cc. fluid extract of ergot.

At 9:16 a. m., wattles and comb red and warm.

At 9:37 a. m., comb bluish and cooler, wattles beginning to blue.

At 9:56 a. m., comb very blue and cold, wattles very cold and blue.

At 11:36 a. m., comb very blue and cold, wattles very cold and blue.

At 1:25 p. m., comb and wattles still bluer. Comb and wattles still blue next day.

Experiment V. Cornutine of Keller, from the fluid extract used in experiment IV, injected hypodermically into the same rooster at 8:30 a. m., wattles and comb red and warm.

At 9 a. m., comb and wattles decidedly blue and cool, bill open.

At 10 a. m., comb and wattles very blue and cold, bill open and panting.

At 1 p. m., comb and wattles still very blue and cold, and still blue next day.

Experiment VI. Filtrate, corresponding to 5 Cc. of original fluid extract from assay of experiment V, neutralized and injected into the same rooster, his comb and wattles being red and warm at 9 : 35 a. m.

At 9 : 58 a. m., comb and wattles still red and warm.

At 10 : 39 a. m., comb pale-bluish on one tip and warm, wattles red and warm.

At 12 a. m., comb pale-bluish on one tip and warm, wattles red and warm.

At 1 : 50 p. m., comb and wattles still red and warm.

Experiment VII. Black and white rooster, weight 4 lbs., comb and wattles red and warm. Injected 5 Cc. fluid extract of ergot at 10 : 53 a. m.

At 11 : 10 a. m., comb and wattles still warm and red.

At 11 : 31 a. m., comb bluish at tips, comb and wattles cooling.

At 11 : 47 a. m., comb bluer, wattles pale and cooler.

At 12 : 07 p. m., comb bluer, wattles pale, almost white, and cool.

At 12 : 55 p. m., comb much bluer and cold, wattles whitish and cold.

At 2 p. m., comb very blue and cold, wattles white and cold.

At 5 p. m., comb still blue at tips and cool, wattles pink and cool.

At 8 : 40 a. m. next morning, comb and wattles red and warm.

Experiment VIII. Black rooster, 5 lbs., wattles and comb red and warm at 12 m. Injected cornutine of Keller obtained from 5 Cc. fluid extract of ergot in experiment VII.

At 12 : 27 m., comb bluing, wattles red.

At 12 : 55 p. m., comb very blue, wattles paler.

At 1 : 45 p. m., comb dark blue and cold, wattles blue and cool.

At 4 : 15 p. m., very blue and cold, wattles very blue and cold.

At 4 : 55 p. m., comb very blue and wattles still blue.

At 8 : 10 a. m., next day, tip of comb still blue, wattles pale.

At 8 : 00 a. m., day after, comb and wattles still pale and cool.

Experiment IX. Black rooster, 5 lbs. Comb and wattles red and warm. At 12 : 35 p. m. injected filtrate corresponding to 5 Cc. fluid extract from experiment VIII, representing all the fluid extract but the cornutine of Keller.

At 1 p. m., comb tips slightly blue, wattles red.

At 1 : 15 p. m., comb tips still pale blue, wattles red and both warm.

At 1 : 55 p. m., one tip only bluish, wattles red.

At 3 p. m., both wattles and comb red and warm.

These experiments indicate (1) that the fluid extracts of ergot used contained active principle or active principles that cause vaso-constriction ; (2) that the product of the assay for the cornutine of Keller causes

fully as much constriction of the arterioles, and is hence at least part, if not all, of the efficient part of ergot that causes vaso-constriction ; (3) that what is left of the fluid extract of ergot does not produce much, if any, of this vaso-constriction, and does not hence contain much, if any, of those active principles of ergot which produce vaso-constriction, and which are generally considered to represent the efficiency of ergot ; and finally (4) that the assay of fluid extract of ergot for Keller's Cornutine is a correct means of standardizing this drug for its vaso-constrictor virtues, or what is generally considered to be its therapeutic efficiency.

Baltimore, September 3, 1902.

THE COMPARATIVE STABILITY OF COLORS IN WALL PAPER.

BY JOHN M. LINDLY, PH. G., WINFIELD, IOWA.

The salesman of wall paper is frequently asked if such a sample will fade, or is confronted with the bold assertion that such a specimen will do so. Usually, he is unable to answer the question definitely, or to deny the charge. Not having noticed any observations on the subject of the stability of colors in wall paper, the writer was prompted to make a few tests or experiments.

Forty-six samples of wall paper, no two alike, representing as many colors, shades and tints, were exposed to the bright sunlight during the middle of the day for two days, making a total exposure of eight hours. This was done in the earlier part of August.

The results are classified into eleven color groups, averaging about four samples to each group.

According to the average resistance of the samples of each group to the influence of the sunlight, the groups have been arranged in the following order of permanence :

1. The whites were unchanged.
2. The drabs were unchanged.
3. Buffs. Half the samples unchanged ; the other half, being the darker, was very slightly lightened.
4. Dark blues. The darkest specimen, unchanged ; the others, slightly changed but not sufficiently to attract attention.
5. Yellows. One, a high priced sample, showed no change ; three showed slight change : the fifth, an ingrain, was much faded.
6. Dark greens. The two darker were very slightly dulled. One of the lighter was apparently unchanged, while the fourth was much faded.
7. Dark browns. Half of these samples exhibited very little change, while the remainder betrayed a noticeable alteration.
8. Light browns. Two showed marked change ; the third only slight.
9. Light greens. All showed change ; a few very much.
10. Reds. All showed great change, the light ones and pinks having faded nearly white.

11. Light blues. All faded nearly white.

The foregoing is offered as the rule for the stability of colors in wall paper, to which, like most rules, there are evident exceptions. These exceptions are probably due to a difference in the chemical material composing the coloring-matter. It was also observed that the light shades were more prone to fade than dark ones. The higher priced papers were more stable than the cheaper ones, with a few exceptions. Gilt and micas were apparently unchanged. Red, pink, green and purple decorations, on any background, faded.

The question may arise as to the colors that were assumed in fading. Specimens of the same papers were exposed during the spring, each for several days, to the strong light of the show window, and sometimes to the direct rays of the sun. The dark or deep reds became a dark purple, sometimes of pinkish-purple hue; the light reds became a light pink. The dark greens assumed a genuine slate color; the light greens approached white, sometimes with a yellowish tinge. The drabs became lighter, approaching white. The browns assumed a dark, reddish drab. Even the whites assumed a cream tint, which is probably the ultimate color into which a majority of all the other colors would finally fade.

When colored glass was placed over a light blue paper, the paper faded least under the green glass and most under the purple glass. When a red paper was treated in a similar manner, it faded least under the red glass and most under the green glass.

It is doubtful if there is any color used in wall paper that is absolutely permanent. However, the gilt and mica, or the gold and silver, on the specimens subjected to the long-time exposures, showed no alteration.

Perhaps, the most permanent wall paper would be that with a white or buff background with gilt and mica decorations.

MINUTES

OF THE

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

FIRST SESSION—FRIDAY MORNING, SEPT. 12, 1902.

The Section was called to order at 10 o'clock a m., in the convention hall of the Hotel Walton by Mr. George W. Sloan, acting Chairman, who said :

Gentlemen : You will notice on the program here that the first order of business is an address by the Chairman. I wish to say that if that refers to me, there is no address. A year ago, at St. Louis, the gentleman who was made Chairman of the Section, very earnestly solicited me to join the Committee with him. I told him I had done my work in the Association, and ought to be allowed to rest. He assured me that there would be no work for me to do, that he simply wished to have me as an advisory member of the Committee. After some correspondence on the subject, I consented, and in two months' time I received a letter from him saying he had resigned from the Association. I immediately wrote to President Whelpley, and told him that under no circumstances would I accept the Chairmanship of this Committee; that it involved a great deal of work, and that in addition to the necessity of making a living, my hands were full of other things. It finally resulted that Mr. Kaemmerer and Mr. Hynson very kindly consented to take up the work, and I wish to say that all the credit that is due for the work of this Committee is due to these gentlemen, for they have done the work.

With this explanation, I will now call upon Mr. Hynson to read a paper he has prepared.

MR. HYNSON: I will not try to read all of my paper at this time, for two reasons: one is, I want a larger audience, if possible; and then there are some gentlemen who desire to present their papers before you this morning instead of this evening, because they cannot be present at the evening meeting.

You all remember that envelopes were sent out asking the members to place in them such notes and prescriptions as they found difficult and send them to the Secretary. Now, I want to read, first, what I had left from the last roll of honor—because if there is one set of members deserving more credit than any other, I think it is the little band

whose names I have before me; those who have taken the pains during the busy hours of the day to note down those little matters of interest that have come up with them from time to time.

Mr. Hynson then read a list of contributors to this paper, on "Contributed Pharmaceutical Notes," embracing such names as Miss Wanous, of St. Paul; Mr. Kaemmerer, of Columbus; Mr. Hallberg, of Chicago; Mr. Dunning, of Baltimore, and others. He then read the introductory part of the paper, and suggested that the paper be now allowed to go over to the evening session, for the reasons already stated, and be then taken up item by item and discussed. This disposition of the paper was agreed to.

The reading of papers was now declared to be in order, and, upon motion of Mr. Kremers, in order to avoid delay, it was ordered that all papers presented be received and referred for publication, unless objection was made.

Mr. Wilbur L. Scoville was called on to read a paper he had prepared on cologne and toilet waters, but the gentleman was not in the room. The chair thereupon called for the report on National Formulary, which Mr. C. Lewis Diehl presented in brief abstract, stating that the report was incomplete, and simply recorded the work that had been done and, as far as possible, finished by the committee. The full text of the paper was as follows :

REPORT OF THE COMMITTEE ON NATIONAL FORMULARY.

To the President and Members of the American Pharmaceutical Association :

In compliance with the expressed wishes of the chairmen of the several sub-committees, whose appointment was announced in my report last year, I have endeavored in the following to give an account of the work that has been done since the date of the last annual meeting, and what progress has been made towards a revision of the National Formulary. I should have much preferred if the chairmen of the sub-committees had submitted individual reports; but the work assigned to them being far from completed, and the present report being simply tentative, it was considered best that the General Chairman should make such selections from the reports that have from time to time reached him from the sub-committees, as might be of general interest, and go on record in the Proceedings of the Association for criticism by the members at large.

While much remains to be done, it will become evident that substantial progress has been made, so that we may with confidence look forward to the completion of this revision simultaneously with the revision of the U. S. P.; and in this connection I desire to emphasize that whatever has been accomplished during the year, is due to the efficiency and industry of the chairmen of the sub-committees, who not alone responded promptly to the suggestions made by the chairman of the General Committee, but in many instances took the initiative in carrying on the work. It is my purpose, therefore, to give an account of their work as near as possible in the language in which it was communicated to me—omitting only that which may be irrelevant or unimportant to the particular subject under consideration.

At the outset it may be here mentioned that during the discussions following the reading of the report in the Section on Practical Pharmacy and Dispensing, several

resolutions were passed which are in the nature of instructions to this Committee, and are as follows :

1. That the titles of preparations, which are too long or cumbersome, should be made as terse as possible.
2. That the numbers used to denote the formulas shall be omitted in future editions.
3. That all formulas dropped from the United States Pharmacopœia shall be included in the National Formulary as has heretofore been the practice.
4. That "it is recommended that no change in either color or flavor be made in any of the preparations of the National Formulary." (This, after discussing the propriety of restoring the color to elixir of potassium bromide.)

These instructions were supplemented by several resolutions by the General Committee, as will appear from the following minutes received from the acting Secretary of the Committee appointed at St. Louis :

PHILADELPHIA, *October 7, 1901.*

"At two meetings of the General Committee on National Formulary held at the Southern Hotel, St. Louis, Mo., on September 18th and 20th, the following conclusions were arrived at after being duly moved, seconded and discussed :

"That in all cases where there was a difference of opinion among the members of any sub-committee, that both a majority and minority report were to be submitted to the General Chairman.

"That formulas dropped from the Pharmacopœia of 1890 be incorporated in the revised edition of the National Formulary when deemed of importance.

"That the Committee on Admissions will consult all sources of information as to the admission of formulæ.

"That where a request is made by any druggist or physician for the admission of a formula for a preparation, that the request be discussed by all the members of the Committee on Admissions and all opinions be referred to the General Chairman.

"That the scheme for work advanced by the General Chairman in his work is approved.

"That no formulæ for preparations be admitted unless the call come from physicians and surgeons for their use in the care of the sick. F. W. E. STEDEN."

In so far as these resolutions pertain to the work done, they have been adhered to in every important particular, and they will doubtless be adhered to to the conclusion of the work unless rescinded or modified. Having supplied each member of the committee with a reprint of the report submitted at the annual meeting, the Committee on Additions, through its Chairman, C. S. N. Hallberg, reported as follows :

1. That the preparations proposed for introduction into the National Formulary, "Exhibit A," Report of 1901, numbering 95 articles, be recommended for addition (except where duplication occurs, as in Nos. 7 and 9).
2. That the Supplementary List of Articles submitted by the Chairman of this Sub-Committee also be recommended for introduction.
3. That this committee will report such further additions as it may deem desirable from reports of local associations.
4. That this committee shall endeavor to transmit promptly to the General Chairman such formulas for the preparations proposed as may be practical.

The "Supplementary List" referred to under (2) is given below, but up to the date of this report no formulas have reached my hands, and the preparations contemplated for addition have therefore not yet been submitted to the Sub-Committee on Construction of Formulas. I append here also some formulas offered by Mr. Wm. Kaemmerer, at the St. Louis meeting, which had in some way been overlooked until Mr. Kaemmerer called my attention to them after the publication of the Proceedings.

Additions proposed for the National Formulary by C. S. Hallberg.

General formulas for the following are proposed:

Tablets—chocolates, pastilles.

Tablets—glycero-gelatins, pastilles.

Tablets—triturations.

Tablets—hypodermic.

Capsules—starch, cachets. Description and mode of filling only.

Capsules—gelatin, hard and soft.

Pill-coating—gelatin, lactose, cacao.

Pill-coatings—enteric-keratin, salol.

Granules—saturates (cactus).

Suppositories—urethral, gelatin.

Linimenta exsiccantia—drying liniments, Unna.

Dermatologic pastes—Lassar, Unna.; kaolin-glycero-plasma.

Stylus—pencils.

Glycero-gelatins, Unna.

Salve-mulls, Unna.

Sterilization of solutions—hypodermic injections; aseptic gauze for dressing; catgut ligature.

Preparations:

Compound alum powder—Squibb (veterinary).

Antiseptic powder—Tyree's.

Petrolatum capsicum.

Camphor menthol.

Preparation proposed by Emanuel:

Cold cream, cosmetic. From petrolatum, aqua, spermaceti, and white wax.

Formulas offered by Mr. Wm. Kaemmerer:

ELIXIR OF TERPIN HYDRATE.

Terpin hydrate (powdered)	384 grains.
Oil of sweet orange	$\frac{1}{2}$ fluid drachm.
Glycerin	10 fluid ounces.
Alcohol, a sufficient quantity to make.....	16 fluid ounces.

Dissolve the terpin hydrate in the glycerin, with the aid of a gentle heat, and when cold add five fluid ounces of alcohol. Dissolve the oil of sweet orange in one-half fluid ounce of alcohol, and mix with the solution of terpin hydrate, glycerin and alcohol, and pass through a plug of cotton placed in the neck of a funnel. Return the first portion until it comes through clear. Lastly, add enough alcohol to make sixteen fluid ounces. Each fluid drachm represents three grains of terpin hydrate.

ELIXIR OF TERPIN HYDRATE AND CODEINE.

Codeine	16 grains.
Alcohol, a sufficient quantity to dissolve the codeine.	
Elixir of terpin hydrate, a sufficient quantity to make....	16 fluid ounces.

Dissolve the codeine in the alcohol, and add enough elixir of terpin hydrate to make 16 fluid ounces.

Each fluid drachm represents about three grains of terpin hydrate and $\frac{1}{8}$ grain of codeine.

ELIXIR OF TERPIN HYDRATE AND HEROIN.

Heroin $5\frac{1}{3}$ grains.

Hydrochloric acid, dilute, a sufficient quantity to dissolve the heroin.

Elixir of terpin hydrate, a sufficient quantity to make.... 16 fluid ounces.

Dissolve the heroin in the dilute hydrochloric acid, and add enough elixir of terpin hydrate to make 16 fluid ounces.

Each fluid drachm represents about three grains of terpin hydrate and $\frac{1}{8}$ th grain of heroin.

Before leaving the subject of additions to the National Formulary I cannot refrain from suggesting that the recommendations of the sub-committee are too sweeping. In presenting the additions mentioned under "Exhibit A," I did so without recommendation or conceding that they were even desirable, and many of them were included simply because they had somewhere or by some one been recommended for inclusion in the National Formulary. Mr. Mittelbach has on every occasion given voice to emphatic protest against the addition of formulas, the admission of which does not seem to be imperative, and so again in his vote on preparations submitted to him as a member of the Sub-Committee on Construction of Formulas. Professor Wilbur L. Scoville, the Chairman of this sub-committee, agrees with Mr. Mittelbach in so far as keeping the number of formulas down to actual demands is concerned. Speaking of the recommendation of the Committee on Additions he says, "If the preparations suggested were all carefully considered, that is well; but articles of purely local demand are questionable additions to the National Formulary." And again, "It has been the aim of our committee to select only those formulas which are likely to meet with general approval. There are a number of formulas in the Cincinnati Academy Formulary, for instance, which I consider unsatisfactory, and I believe that with further work they may be improved, or more satisfactory formulas secured. Otherwise a larger number of formulas might have been voted upon. If the number of new formulas to be worked up can be reduced from the first report of the Committee on Additions, I think all of the new formulas can be worked up in another year."

The following is the full text of the formulas which have been accepted with practical unanimity by the Sub-Committee on Construction of Formulas, and are recommended for adoption:

ELIXIR GENTIANÆ GLYCERINATA.

Glycerinated Elixir of Gentian.

Gentian in No. 30 powder, twenty grammes	20 Gm.
Dandelion in No. 30 powder, thirty grammes	30 Gm.
Sugar, one hundred and fifty grammes.....	150 Gm.
Glycerin, four hundred cubic centimeters	400 Cc.
Compound tincture of cardamom, sixty cubic centimeters.....	60 Cc.
Solution of saccharin (N. F.), twenty cubic centimeters.....	20 Cc.
Spirit of orange, U. S. P., ten cubic centimeters.....	10 Cc.
Phosphoric acid, five cubic centimeters	5 Cc.
Acetic ether, two and one-half cubic centimeters	2.5 Cc.
Sherry wine, a sufficient quantity.	

To make one thousand cubic centimeters 1000 Cc.

Moisten the drugs with the spirit of orange and fifteen cubic centimeters of wine, and set it aside for twelve hours. Then pack it in a percolator and pour on wine until four hundred cubic centimeters (400 Cc.) of percolate are obtained. In this dissolve the

sugar, add the other ingredients, filter if necessary, and add enough wine to make one thousand grammes.

EMULSUM PETROLEI.

Emulsion of Petroleum.

Petrolatum, U. S. P., fifty grammes	50 Gm.
Expressed oil of almond, two hundred and fifty grammes.....	250 Gm.
Powdered acacia, fifty grammes	50 Gm.
Powdered tragacanth, fifteen grammes.....	15 Gm.
Water, a sufficient quantity.	

To make one thousand cubic centimeters 1000 Cc.

Melt the petrolatum and mix thoroughly with the almond oil. Mix the gums in a capacious mortar with one hundred and fifty cubic centimeters of water and add the oil mixture gradually, triturating rapidly until a smooth emulsion is formed. Lastly, add enough water to make one thousand cubic centimeters.

EXTRACTUM RHAMNI PURSHIANAE FLUIDUM ALKALINUM.

Bitterless Fluid Extract of Cascara Sagrada.

Cascara sagrada, in No. 20 powder, one thousand grammes..	1000 Gm.
Lime, fifty grammes.....	50 Gm.
Sugar, four hundred grammes.....	400 Gm.
Oil of coriander, eight-tenths cubic centimeter.....	0.8 Cc.
Oil of anise, four-tenths cubic centimeter.....	0.4 Cc.
Water, a sufficient quantity.	

To make one thousand cubic centimeters 1000 Cc.

Slake the lime and mix with two thousand (2000) cubic centimeters of water. Stir in the cascara and digest on a water bath six hours, or until only a faint bitterness is apparent to the taste. Then transfer the mixture to a percolator and allow to drain. Now pour on water until the cascara is exhausted. Evaporate the percolate on a water bath to a volume of seven hundred and fifty (750) cubic centimeters and dissolve the sugar in this fluid. Add the oils and agitate thoroughly. Filter if necessary, and add enough water to make one thousand cubic centimeters.

SODII PHOSPHAS LIQUEFACTUS.

Liquefied Sodium Phosphate.

Sodium phosphate, in crystals, one hundred grammes	100 Gm.
Citric acid, twenty-three and four-tenths grammes.....	23.4 Gm.
To make one hundred cubic centimeters.....	100 Cc.

Triturate them together in a warm mortar until a liquid is obtained.

LIQUOR ANTISEPTICUS.

Antiseptic Solution.

Thymol, one gramme.....	1 Gm.
Menthol, one gramme	1 Gm.
Eucalyptol, one cubic centimeter	1 Cc.
Oil of wintergreen (true), one cubic centimeter	1 Cc.
Fluid extract of wild indigo, eight cubic centimeters.....	8 Cc.
Natural benzoic acid, eight grammes.....	8 Gm.
Powdered orris root, ten grammes	10 Gm.
Boric acid, twenty-four grammes	24 Gm.
Alcohol, three hundred and seventy-five cubic centimeters.....	375 Cc.
Water, six hundred and twenty-five cubic centimeters.....	625 Cc.

To make about one thousand cubic centimeters..... 1000 Cc.

Dissolve the thymol, menthol, eucalyptol, oil, benzoic acid, and fluid extract in the alcohol and add the powdered orris. Macerate seven days with frequent shaking. Dissolve the boric acid in the water and add to the alcoholic solution. Shake frequently during fourteen days, then filter.

LIQUOR CRESOLI. (VEL LIQUOR DISINFECTANS.)

Solution of Cresol (or Disinfectant Solution).

Cresylic acid, six hundred and twenty-five grammes	625 Gm.
Potassa, eighteen grammes	18 Gm.
Resin, one hundred and twenty-five grammes.....	125 Gm.
Water, a sufficient quantity.	

To make one thousand grammes 1000 Gm.

Heat the cresylic acid and resin together in a suitable dish until the resin is dissolved. Dissolve the potassa in eighty (80) grammes of water, add to the resin solution and boil until the latter is completely saponified, and the fluid has become clear. Cool and add enough water to make one thousand grammes.

TINCTURA CRESOLI SAPONATA.

Saponated Tincture of Cresol.

Cresylic acid, three hundred and fifty grammes	350 Gm.
Soft soap, U. S. P., four hundred and fifty grammes	450 Gm.
Alcohol, a sufficient quantity.	

To make one thousand cubic centimeters..... 1000 Cc.

Dissolve the cresylic acid and soap in the alcohol, filter and add enough water through the filter to make one thousand cubic centimeters.

LIQUOR FERRI ALBUMINATI.

Solution of Albuminate of Iron.

Egg albumen, liquid, forty grammes	40 Gm.
Dialyzed iron, two hundred cubic centimeters.....	200 Cc.
Alcohol, one hundred and twenty cubic centimeters	120 Cc.
Aromatic elixir, four hundred cubic centimeters.....	400 Cc.
Solution of soda, distilled water, of each a sufficient quantity.	

To make one thousand cubic centimeters..... 1000 Cc.

Dissolve the albumen in two thousand (2000) cubic centimeters of distilled water, strain the solution through muslin and add the dialyzed iron previously diluted with two thousand (2000) cubic centimeters of distilled water. Dilute twelve (12) cubic centimeters of solution of soda with one hundred (100) cubic centimeters of water and cautiously add a sufficient quantity of this fluid to the iron mixture to exactly neutralize it, as shown by the precipitate, which at first is light and fine, becoming flocculent and settling to leave a clear and nearly colorless supernatant liquid. (An excess must be carefully avoided.) Wash the precipitate rapidly by decantation with distilled (or with freshly boiled and cooled) water until the washings give but a slight cloudiness with silver nitrate test solution. Drain the precipitate on a muslin strainer, transfer to a porcelain dish, immediately add fourteen (14) grammes of solution of soda and while stirring add distilled water (not exceeding one hundred and fifty cubic centimeters) until the precipitate is dissolved. Then add the alcohol and aromatic elixir, and enough distilled water to make one thousand cubic centimeters.

(One teaspoonful of this solution contains about four-tenths (0.4) of a grain of metallic iron in the form of albuminate.)

LIQUOR FERRI PEPTONATI.

Solution of Peptonate of Iron.

Peptone, dry, forty grammes.....	40 Gm.
Dialyzed iron, two hundred centimeters	200 Cc.
Alcohol, one hundred and twenty cubic centimeters	120 Cc.
Aromatic elixir, four hundred cubic centimeters..	400 Cc.
Solution of soda, distilled water, of each a sufficient quantity.	

To make one thousand cubic centimeters..... 1000 Cc.

Dissolve the peptone in two thousand (2000) cubic centimeters of distilled water and add the dialyzed iron previously diluted with two thousand (2000) cubic centimeters of distilled water. Dilute twelve (12) cubic centimeters of solution of soda with one hundred (100) cubic centimeters of distilled water, and cautiously add sufficient of this solution to the iron mixture to exactly neutralize it, as shown by the precipitate, which at first is light and fine, becoming flocculent and settling to leave a clear and nearly colorless supernatant liquid. (An excess must be carefully avoided.) Wash the precipitate rapidly by decantation with distilled water (or with freshly boiled and cooled water), until the washings give but a slight cloudiness with silver nitrate test solution. Drain the precipitate on a muslin strainer, transfer to a porcelain dish, immediately add fourteen (14) cubic centimeters of solution of soda, and while stirring, add distilled water (not exceeding one hundred and fifty cubic centimeters) until the precipitate is dissolved. Then add the alcohol and aromatic elixir, and enough distilled water to make one thousand (1000) cubic centimeters.

(One teaspoonful of this solution contains about four-tenths (0.4) of a grain of metallic iron, in the form of peptonate.)

LIQUOR HYPOPHOSPHITUM.

Solution of Hypophosphites.

Calcium hypophosphite, eight and one-half grammes.....	8.5	Gm.
Potassium hypophosphite, eight and one-half grammes....	8.5	Gm.
Sodium hypophosphite, two and two-tenths grammes.....	2.2	Gm.
Ferric hypophosphite, four and four-tenths grammes.....	4.4	Gm.
Manganese hypophosphite, two and two-tenths grammes ..	2.2	Gm.
Quinine hypophosphite, two and two-tenths grammes.....	2.2	Gm.
Strychnine, sixty-five milligrammes.....	0.065	Gm.
Potassium citrate, eight and one-half grammes	8.5	Gm.
Citric acid, six and four-tenths grammes.....	6.4	Gm.
Orange-flower water, thirty-five cubic centimeters.....	35.	Cc.
Glycerin, two hundred and fifty cubic centimeters	250.	Cc.
Distilled water, a sufficient quantity.		

To make one thousand cubic centimeters..... 1000. Cc.

Dissolve the calcium, sodium, and potassium hypophosphites in three hundred (300) cubic centimeters of distilled water. Dissolve the iron, manganese, and quinine hypophosphites, and the strychnine, potassium citrate, and citric acid in two hundred and fifty (250) cubic centimeters of distilled water. Mix the solutions, filter if necessary, and add the orange flower water and glycerin, and enough distilled water to make one thousand (1000) cubic centimeters.

SYRUPUS QUINIDINÆ.

Syrup of Quinidine.

Quinidine, in crystals, thirty-three grammes.....	33 Gm.
Mucilage of acacia, sixty cubic centimeters.....	60 Cc.
Solution of saccharin, thirty cubic centimeters	30 Cc.
Syrup of orange flower water, a sufficient quantity.	

To make one thousand cubic centimeters 1000 Cc.

Mix them without trituration.

Formulas have also been constructed for the following preparations, but are withheld from the present report because no definite agreement has been reached by the members of the sub-committee :

Elixir of lactated pepsin.
 Essence of pepsin.
 Elixir of terpin hydrate.
 Elixir of terpin hydrate with codeine.
 Elixir of terpin hydrate with heroin.
 Emulsion of iodoform.
 Emulsion of cod-liver oil—malted.
 Iron albuminate—dry.
 Iron peptonate—dry.
 Syrup of licorice.

On these formulas, as well as on some of those that have been definitely proposed by the sub-committee, the following criticisms that have been made may be mentioned :

Mr. Alpers, who did not vote positively on any item, on the plea of not having found the time to try the formulas, does not approve of formulas which are designed to imitate or displace proprietary preparations, on the ground that such action means substitution and is not ethical. He objects to the formula for *Liquefied Sodium Phosphate*, on the ground that it is too viscid to filter, and suggests reducing the strength to 50 grains per teaspoonful by addition of water. He suggests that *Elixir of Terpin Hydrate* should be flavored, and so formulated that codeine or heroin could be added in any proportion desired to make these double elixirs. Mr. Eberle having made similar suggestions, the chairman of the sub-committee has withdrawn the formula for terpin hydrate elixirs for the present, to be modified and again submitted to the sub-committee for approval.

Formulas for *Elixir of Lactated Pepsin* and *Essence of Pepsin* were withdrawn because of the unanimous objection of the sub-committee to the recognition of certain proprietary constituents that would have been required, and because the National Formulary already contains formulas for similar preparations.

With regard to the formula for *Solution of Albuminate of Iron*, Professor Scoville makes the following remarks: "The average man will need to learn to operate this formula successfully. There is a trick in using just the right quantity of weak solution of soda to precipitate. A slight excess will make a muddy solution which cannot be clarified, and the average operator will spoil some samples before he learns the trick. Once learned, it is easy to produce a beautiful preparation which is true to its name.

The formulas for *Solution and Saponified Tincture of Cresylic Acid* furnish preparations which respectively replace "Creolin" and "Lysol." It is important that the *tincture* be made from a fresh sample of cresylic acid, otherwise it becomes too dark.

During the year intervening since the last annual meeting, the Chairman of the Sub-Committee on Correction of Formulas, Professor A. B. Stevens, issued five circular letters to the members of his Committee, which gives evidence of the difficulties encountered in the work assigned to him as well as to the minute and careful attention given to each

subject. From these circular letters, which have been filed for future reference, it develops that while much has been done, much remains to do. The following is a brief synopsis of the agreements reached by vote :

Camphorated Chloral (Form No. 23). The camphor is to be directed in the powdered condition.

Preparations of Hypophosphites, containing calcium hypophosphite, should be made with the addition of hypophosphorous acid instead of citric acid wherever the latter is now directed. This includes Form. Nos. 43, 49, 80, 82, 360, 361, 378.

Compound Syrup of Hypophosphites (Form. No. 378). In place of potassium citrate, 5 Gm., sodium citrate, 3.75 Gm., is to be used.

"*Cloudy*" *Compound Syrup of Hypophosphites* (Form. No. 378). The question of modifying the formula so as to produce a clear syrup, or the introduction of an additional formula that will produce a clear syrup, has not been decided by vote, but it is clearly the intention that a

"*Clear*" *Compound Syrup of Hypophosphites* will also be introduced. It has been proposed to reduce the amount of calcium hypophosphite in this new preparation to one-half (from 35 Gm. to 17.5 Gm. in the liter). Prof. Stevens, however, suggests the following formula, which is based on that proposed by Mr. Hynson (No. 4, Proceedings 1901, p. 193) :

Calcium hypophosphite.....	.35 Gm.
Potassium hypophosphite	17.5 Gm.
Sodium hypophosphite	17.5 Gm.
Manganese hypophosphite	2.25 Gm.
Ferrous sulphate.....	6.72 Gm.
Quinine bisulphate.....	1.6 Gm.
Strychnine sulphate.....	0.3 Gm.
Hypophosphorous acid, dilute	2.0 Cc.
Sugar	800.0 Gm.
Water, enough to make	1000.0 Cc.

Hypodermic Solution of Morphine (Form. No. 231) is to be preserved by the addition of 0.1 Gm. of salicylic acid to 100 Cc. of the solution.

Solution of Phosphorus (Form. No. 235). Instead of directing the solution of the phosphorus in a stoppered vial or test-tube, it is to be effected in a vial or flask closed with a perforated stopper bearing a glass tube two feet in length, to act as an air condenser for the absolute alcohol, and to prevent danger during the heating.

Compound Copaiba Mixture (Form. No. 264, I-Lafayette Mixture). Mucilage of acacia is to be used in place of mucilage of dextrin.

Compound Mixture of Chloral and Potassium Bromide (Form. No. 261). The proposition to change the formula either in conformity with that suggested in Formula Nos. 2 or 4, p. 197, Proceedings, 1901, has not been decided. Prof. Stevens has suggested that the members make a sample by each of the three formulas, so that they may form a definite conclusion when a vote is again asked.

Compound Digestive Elixir (Form. No. 59). The proposition that elixir of quinine be added to this elixir (in small proportions—see Proceedings, 1901, p. 199) has been rejected, but it was voted to reduce the quantity of acids in conformity with the suggestion made on p. 195, Proceedings 1901.

Elixir of Pepsin (Form. 88). Various suggestions have been made with regard to changes in this formula, but no definite conclusion has been reached. Prof. Stevens suggests the following formula which he thinks will harmonize the various suggestions made :

Glycerite of pepsin.....	200 Cc.
Glycerin.	100 Cc.
Hydrochloric acid.....	2 Cc.
Aromatic elixir, sufficient to make	1000 Cc.

Wine of Pepsin (Form. No. 450) is to be prepared fresh, as required, using glycerite of pepsin and stronger white wine.

Stronger White Wine. It was voted that this be discarded in the formulas, and that white wine and the necessary quantity of alcohol to fortify it, be directed when required.

Wine of Beef and Iron (Form., No. 445). The proposition to substitute formula No. 5, p. 194, Proceedings, 1901, for the present formula remains undecided. Prof. Stevens suggests that members of the Committee prepare samples by the National Formulary Formula, by Formula No. 5, and another by the latter method, using detannated sherry wine.

Syrup of Dover's Powder (Form. No. 379). The proposition to substitute water for the cinnamon water directed in this formula has been rejected.

Bismuth Glycerite (Form. No. 185), and consequently all the other preparations into which this glycerite enters, shall be made by the formula proposed in Caspari's Treatise on Pharmacy (1895, p. 237), in which bismuth-sodium tartrate is substituted for bismuth-ammonium citrate. But in the case of

Liquor Bismuthi (Form. No. 212), both formulas are to be retained as now given.

Elixir of Potassium Bromide (Form., No. 97). The vote on the question of restoring the color to this elixir is decidedly in the negative, but in view of the numerous requests from isolated localities, it was conceded that a note be appended to the formula as follows: "If a colored elixir is preferred add — Cc. of compound tincture of cudbear and use — Cc. less of aromatic elixir." The exact quantity to be agreed upon later.

Compound Elixir of Quinine (Form. No. 98). It has been suggested that this elixir should take the place of elixir of cinchona (Form. No. 47) and of detannated elixir of cinchona (Form. 48), and that the last two be dismissed from the National Formulary. No decision has been reached on this question.

Adjuvant Elixir (Form. No. 31). Prof. Stevens requests that the members of his committee compare this elixir with one prepared as follows:

Solution of licorice, N. F.....	60 Cc.
Solution of saccharin, N. F.....	30 Cc.
Aromatic elixir, enough to make	1000 Cc.
Mix and filter. Also to compare the	

Compound Cathartic Elixir (Form. No. 45) with one made by the following formula:

Fl. ext. rhubarb	65. Cc.
Fl. Ext. buckthorn.....	130. Cc.
Fl. Ext. Senna	100. Cc.
Oil of peppermint	1.4 Cc.
Solution of Potassa	4.5 Cc.
Saccharin	4.5 Cc.
Aromatic elixir, sufficient to make	1000. Cc.

Allow to stand 24 hours and filter.

Syrup of Citro-Iodide of Iron (Form. No. 371). The present directions produce a product containing an excess of ferrous iodide. Prof. Stevens has corrected this so that, using the same proportion of iodine, this is all present in form of ferric iodide.

Tincture of Citro-Chloride of Iron (Form. No. 407). It has been proposed to omit the alcohol from this preparation and to change the title from "tincture" to "liquor." This proposition has been rejected.

Bleaching Sponges (Form. No. 355). It has been suggested that rinsing the sponges, otherwise treated as prescribed in the N. F., in either milk of lime or in a 10 per cent, solution of sodium carbonate, before the final washing in water and drying, produces a better product, conforming in appearance and quality to the best commercial bleached

sponges. It is voted that this suggestion be adopted and that sodium carbonate solution be used for rinsing.

Some of the corrections made may seem trivial; but in reality they are not so, when we consider that the purpose of the "Formulary" is to supply not alone formulas for certain preparations in popular demand, but expeditious methods of preparing them, with reasonable certainty that careful adherence to the directions will insure uniformity in results. If the formulas were intended for experts alone, many of the details, if not all, could be omitted, and it might suffice to simply state that such and such ingredients are to be used in specified quantities to produce the preparation contemplated. But the formulas are intended for the busy every-day pharmacist, and it is important that explicit, although terse, directions should be given that cannot be misinterpreted even by the neophyte. Let us consider, by way of example, the first preparation mentioned by the Sub-Committee on Correction of Formulas—"Camphorated chloral." Nothing is more simple than to make this preparation. It suffices to mix chloral in crystals and camphor in lumps and to leave the mixture to itself, in a bottle, under occasional agitation. But this is not an expeditious way, nor one that is likely to be resorted to by the practical pharmacist; yet, the N. F. directs some such method, giving as an alternative that the two substances may be triturated together in a warm mortar until liquefaction results. Now, to make the directions more definite and to save time, Mr. Hynson (Proceedings, 1901, p. 191) recommended the following change: "Powder camphor with chloroform, in a mortar and the chloral in another. Mix powders and triturate until a clear liquid results." This suggestion is certainly in the right direction, and I am not sure that the simple adoption by the sub-committee of "powdered camphor" will fulfill the objects aimed at by Mr. Hynson—definiteness and expeditiousness. The possible objection is the use of chloroform for powdering the camphor; but even under the resolution of the Sub-Committee that "powdered camphor" shall be used for making the preparation, there would be nothing conflicting with it if the formulas were constructed as follows:

Chloral, in <i>dry</i> crystals	50 Gm.
Camphor in <i>clean</i> pieces	50 Gm.

Reduce the camphor and chloral separately to powder, mix them, and triturate the mixture until it is completely liquefied.

So, let us not lose sight of the small things; for our profession is made up of apparently unimportant trifles, which in their aggregation constitute an important whole.

Respectfully submitted,

C. LEWIS DIEHL, *Chairman.*

The report was received with applause.

MR. HYNSON: I am sure the store-workers, of which I am one, feel under great obligations to Mr. Diehl and his Committee for this very elaborate, painstaking report, and I think this Section should express its sincere thanks for this valuable paper, and I move accordingly. Also, in order that the paper may be more thoroughly discussed, I move that further consideration of it be deferred until the evening session, when more extensive exhibits of preparations can be made and fuller discussion had.

The motion was put and carried.

MR. HYNSON: Gentlemen, it is our good fortune and happiness, as the *baby* Section of this Association, to present to you at this meeting a feature of unusual interest. We have with us to-day the gentleman who read the very first paper ever read before the American Pharmaceutical Association. [Applause.] Just think what that means. The man who stood first before the forefathers of this Association to read a paper—which was then an excellent paper and which is an excellent paper to-day, and still pertinent; and

gentleman, who was not only the first to read a paper before the Association, but the first graduate of one of our distinguished colleges. [Applause.] I will say, also, that he was first in the hearts of those who loved him. Gentlemen, I have the pleasure of introducing to you Mr. Alpheus P. Sharp, of Baltimore. [Applause.]

Mr. Sharp then said :

Mr. Chairman, as a preface to the reading of this paper I desire to make a brief explanation of why I am here to-day. As this article was the first to be read before the Association near fifty years ago, and the author is still living (as you see for yourselves), some of my friends urged me in person to attend this meeting and read the paper, as they seemed to think its presentation by the author, after so long a time, would prove of some interest. Others wrote me to the same effect—one of them writing that he hoped the infirmities of old age would not prevent me from coming. The latter settled the question; and his letter reminded me of my first meeting with the Father of Pharmacy, William Procter, Jr., near fifty-five years ago. I had read his articles for years, and associated him in my mind as an old, grayhaired gentleman with big glasses, reminding one somewhat of Horace Greeley. I was astonished to find almost a boy's face, with no gray hair or defective eyes. From that hour to his death, I am glad to know we remained intimate friends; and when he visited Baltimore, he knew the welcome he would receive at my home. I remember on his last visit, after breakfast, he proposed a walk to see the house where he was born. It was a small stone house in the northern section of Baltimore, two stories, with no hall. During our walk it distressed me to feel that it would be his last visit. We had to stop several times in order that he might get relief from a pain in his heart from which he was suffering. But this is digressing, and I will now read the paper I read before this Association so many years ago.

ON THE STRENGTH OF COMMERCIAL MURIATIC AND NITRIC ACIDS AND ALCOHOL.

READ BEFORE THE A. PH. A. BY A. P. SHARP IN 1855.

As so little attention is paid by the manufacturing chemist and distiller to the officinal strength of the above articles, and as they enter largely into the various preparations of the pharmacist, I beg leave to offer a few remarks on them.

After a careful examination of all the samples of acid I could obtain both from the druggists as well as manufacturers, I am fully satisfied that no attention whatever is paid to the requirements of the Pharmacopœia, notwithstanding its preparations are based upon the principle that the acids have certain specific gravities, which are given, as well as the tests of their purity. Now assuming this to be the case, the pharmacist cannot carry out the true intent of the Pharmacopœia, for it is utterly impossible to obtain the acids of the proper specific gravities.

Muriatic acid, according to the Pharmacopœia, should have a specific gravity of 1.160. The strongest pure acid I have yet found, varies from 1.120 to 1.130. The common commercial article is generally about 1.140. Nitric acid is directed to have a specific gravity of 1.420. The article manufactured in Philadelphia by Messrs. Powers & Weightman, and sold

as it should be, it intended, as I have suggested, for making the preparations of the Pharmacopœia. The strongest commercial article I have ever obtained had a specific gravity of 1.370. In view of the above facts, in not being able to obtain the acids of the officinal strength, it seems necessary that the Pharmacopœia should be so altered as to comply with such as can be obtained, or as a more rational view, the pharmacist should insist upon having his acids made of the proper officinal specific gravity. Every pharmacist has no doubt experienced the difficulty (in preparing the tincture of chloride of iron) of dissolving all the iron, owing to the deficiency of the acid in the water. Also in preparing the solution of the permanganate of iron, instead of having the preparation as desired, it often (at least with me) turns out to be nothing but the solution of the proto-nitrate, entirely owing to the weak acid. It is true, it is easy to overcome the difficulty by not diluting the acid as much as directed, but you still have a weaker article than desired. Another important article in our line shares the same fate—I mean alcohol. The Pharmacopœia directs it to have a specific gravity of .835 or 85 per cent. of absolute alcohol by weight. I know of but two kinds in commerce, 80 and 95 per cent., the latter a mere name only. As it is just as easy to prepare 85 as 80, I cannot tell why the officinal strength is not found in commerce as well as the other. However, when we take into consideration the fact that the strength of alcohol depends upon the locality of its manufacture, it is not much to be wondered at, and upon this subject I have a few remarks to make. As I said before, the strength of alcohol depends upon its locality; strange as this may appear, it is nevertheless true. 98 per cent. alcohol in Cincinnati is 95 in New York, and 88 to 85 (according to all my experiments) in Baltimore; and why this difference? I can only account for it in the following reasons: firstly, the instruments for testing the spirit are based upon a wrong principle, by assuming the strongest by ordinary distillation to be alcohol, as is the case with the Pennsylvania instrument made by Mr. Fisher, of Philadelphia. Secondly, the instruments being generally made for testing spirits from first to fourth proof, proper attention is not directed to the important fact of the great variation of the expansion of alcohol as the strength increases.

As an evidence of the latter difficulty, I will take occasion to mention a dispute on the strength of alcohol which took place in Baltimore some months ago. There was a lot of alcohol sold warranted to be 95 per cent.; by examining it with another instrument it only showed 89 per cent. A sample of it was carefully examined by a reliable hydrometer as well as by the specific gravity bottle with a delicate balance, and I could not make it out stronger than 89 per cent., so this opened the matter to a further investigation. The alcohol proved to be 95 per cent., by an instru-

of silver with the ordinary graduation to show the different degrees of whiskey, as well as another scale to show the percentage of alcohol. As there was evidently a defect somewhere, for my own satisfaction I determined to find out what it was, and to do so, commenced testing the instrument with proof whiskey, and continued testing until I got to 80 per cent. alcohol, to which point I found it perfectly correct; but from that point up it was wrong, which fully satisfied me there was not sufficient allowance made in the graduation for the difference in the expansion of the alcohol. However, as the owner of the hydrometer still insisted it was correct, and all my trouble amounted to nothing, I determined to go a little further. Seeing his hydrometer in 89 per cent. alcohol sunk to 95, I felt quite sure a few degrees stronger would sink the instrument; I therefore soon had some alcohol distilled over chloride of calcium, and with much care and attention I obtained spirit, which by the reliable hydrometer spoken of before, as well as the specific gravity bottle, showed it to be 96 per cent. I felt quite sure it was strong enough for my purpose. I delivered it to the gentleman, with a request to try the per cent. with his instrument, and although the stem was of sufficient length to admit of at least five degrees above the hundred, the hydrometer immediately sunk in it, which was convincing proof to him that the instrument was incorrect for spirits above 80, and that the 98 per cent. alcohol of Cincinnati and 95 of New York is nothing but the simple 88 or 89 per cent. alcohol, or the strongest obtained by ordinary distillation.

Another difference often occurs in alcoholometers. Some are made to show the per cent. by weight, that is, 80 per cent. alcohol contains 80 pounds absolute alcohol and 20 pounds water, and the other kind shows the per cent. by volume, or 80 per cent. alcohol would be 80 pints absolute alcohol and 20 pints water, which of course makes considerable difference in the two scales. The latter scale by Tralles, is the one adopted by the government, and they are now using the glass hydrometer with a thermometer in the bulb for correcting the temperature, etc., as being the most reliable instrument. They are made in the best style by Luhme & Co., of Berlin.

Great applause followed Mr. Sharp's reading of his paper.

MR. HYNSON: I cannot let this occasion pass without saying a word or two. This incident puts us in such close touch with the past that I feel almost as if I were in the presence of those who heard that paper years ago.

In this connection I would like to say that I asked Mr. Dunning, of Baltimore, to make an examination of a number of samples of hydrochloric and nitric acid obtained from some of the best makers, and he did so with rather surprising results. The strength recognized by the Pharmacopœia as being correct for hydrochloric acid is 31.9 per cent., and 68 per cent. for nitric acid. The several samples of hydrochloric acid tested showed results as follows: 36, 33, 36.3, 31.21 and 30.6 per cent. None of them were right. Absolutely not one of these people had an acid which conformed to the Pharmacopœia.

it. And a great many of the unexpected results which occur are no doubt due solely to this want of uniformity of strength in regard to these acids and failure to comply with the Pharmacopœia requirements. With nitric acid, which should be 68 per cent. according to the Pharmacopœia, one sample showed 65 per cent., another 65, another 65.3, and one alone 68. One was less than 60. The hydrochloric acids nearly all seemed to be too strong; the nitric acids too weak. It seems to me we might note these facts with a great deal of profit. The trouble comes from not ordering medicinal United States Pharmacopœia acids. Of course, acids will change in strength after a while, but we should get them of definite strength. If we order merely C. P. acids it is not definite enough. In regard to alcohol, I think that is nearly always correct.

Now, Mr. Chairman, I move a special vote of thanks to Mr. Sharp for his appearance here, and our best wishes for many years of a happy and comfortable life. [Applause.]

The chair called for a rising vote on the motion, and it carried unanimously.

MR. HYNSON: I have another great pleasure now. There is one man out of the multitude of others in this great country who, though a young man, has given aid to this Section as no other man has done. He presented a paper of unusual merit at the last meeting, and the committee has decided that he is entitled to the generous prize which has been given the Association by our honored ex-President, Mr. Enno Sander, of St. Louis. I will read a communication which explains itself:

"LOUISVILLE, KY., June 10, 1902.

MR. HENRY P. HYNSON, BALTIMORE:

My dear Sir: In reply to yours of the 7th inst., which is received to-day, beg to say that, as previously requested, I have looked over the papers read before the Section on Practical Pharmacy and Dispensing, and agree with you that the Enno Sander Prize should be awarded to Mr. William Kaemmerer for his eminently practical paper entitled, 'How We Increased Our Subscription Business.'

"Very sincerely,

C. LEWIS DIEHL."

Applause greeted the reading of this letter.

MR. HYNSON (continuing): Now, I will ask Mr. Sander to present this paper to Mr. Kaemmerer, which will entitle him to the \$50 Enno Sander Prize.

Mr. Sander came forward, and, addressing Mr. Kaemmerer as he stood in his place on the rostrum as Secretary of the Section, said:

I beg to present this paper to you, Mr. Kaemmerer, as an evidence of your assiduity, your intelligence and your energy in the line of practical pharmaceutical work, and I hope you may continue to earn awards until you, too, reach the age of eighty years. [Applause.]

MR. KAEMMERER: I wish to thank Mr. Sander and the Committee, and to say to Mr. Sander that I hope he may live yet a long time, so that he may present his prize to many others in the future.

I think it may not be out of place here to state how I came to write that paper. It was brought forth by the offer of a prize—that first got me into the idea of it. After thinking over the matter, however, I concluded I could not write a paper after all—like a great many others of you who think you cannot write a paper; but you can if you make up your minds to do it and get down to it. I was a long while making up my mind. I kept putting it off from time to time, until the time had gone by. I believe the

that an paper for competition would have to be in by June 1st, or July 1st, I forget which. I kept putting it off, as I have said, until the time was long past for presenting it. Then I thought I had better write it anyhow, even if I didn't get a prize—maybe it might be of some value to somebody. So I started. Well, it was just simply an experience I had had of something that occurred during every-day business. I might state that, in 1898, after graduating, I came back to my home and was out of a position, actually—for the first time in my life; and I had to hunt around for one. Some men offered me as much as thirty-five dollars a month! I was idle, I believe, about two weeks. Then I ran across my present position, and the gentleman was foolish enough to offer me fifty dollars a month, and I took him up right away. The place was not as desirable a position as one could wish, so I made up my mind I would make it so. The store had run down, because the former proprietor was in politics, and you know what that will do with a store. It was bought out by a young man, a friend of mine, and it so happened that the clerk he had was compelled, on account of his health, to give up his position, and that is the way I got in there. I saw immediately what was the matter with the store. It had been running down, and the people hadn't any confidence in it. They were doing hardly any prescription trade. So I said to my employer one day, "I don't like the way things are here; we are hardly doing any prescription trade at all. We have all the facilities, and I think I can work up a nice prescription trade; and if we have that, the rest of the trade will come to us." Now, up to this time, he had been buying everything—elixirs and all that—and I said, "We can make these as well as anybody else; I am sure we can." He agreed, and so I started to make a few; and the first was an elixir of valerianate of ammonia. And then I made some syrup of iodide of iron, which was very fine, I thought. I said I would make up some elixirs and take them around to the physicians and talk to them about it. At first I only went to a few. They were well pleased with what I had to say, and they met and treated me nicely. At first I was afraid to go to them, because I thought they would not want to talk to me. I thought the representatives of the manufacturing establishments had the field all to themselves. But you need not fear this, for you can go around and meet them on an equal footing. It is a mistake to think the doctors know so much more than you do that you must bow down to them. You can go around and show them that you know more about your part of the business than they do; and they will listen to you, and you will get their prescriptions, too. That is the way I found it. I was only sorry I could not keep up the work; but the fact is, business increased to such an extent that I could not do it, unless we made some arrangement to get more help. But we have increased our help, and still I have been unable to get around.

I want to say this, that this Section ought to have more work from the pharmacists, because they can write papers if they will. They just think they can't write them. There are many things happening every day that are of interest to a great many of us. If they would just make a note of these things and write out what they have observed, that is the thing to do. Oftentimes it looks as though you must fairly choke out of some pharmacists what they know and have learned in their experience. Now, we want them to come here and tell us of their experience, by papers read before this Section. [Applause.]

Mr. Lloyd being next called upon, read the following paper upon the subject of "The Chapman Suppository Mold : "

During the years 1864 and '65, Dr. Wm. B. Chapman, a talented and educated pharmacist of Cincinnati, constructed the accompanying metal suppository mold. Up to that time it had been customary in this city to make suppositories by twisting a small sheet of paper into a cone, waxing the edges, the top and the bottom with sealing-wax, and pouring therein the medicated cacao butter. Dr. Chapman conceived rightly the idea that metal molds could be made to better accomplish this purpose, and for a considerable time he received from such men as Prof. Roberts Bartholow and others, the major part of the suppository prescriptions of this city. Dr. Chapman was not selfish in his methods, as he made these molds for others as well as himself and sold them to pharmacists at the price of \$5.00, which considering the labor of manufacture was very reasonable. It was my good fortune to be engaged in business as a clerk with Dr. Chapman, and I may say that these years of prescription work under his special direction were to me a source of invaluable knowledge. I purchased from him a set of the suppository molds, and used them subsequently for years in prescription work, and now after more than thirty years have passed bring them herewith before the Society. These molds are, so far as I know, the earliest form of suppository mold. Indeed, I am not sure that the statement may not be applied to the country at large as well as Cincinnati.

And now a word concerning the suppository business at that date. Dr. Chapman's method was to first make unmedicated suppositories and use these for subsequent medication, thus getting the remedy evenly divided into an exact number of suppositories. The method of manipulation was as follows :

The suppository mold was placed on a cake of ice and allowed to become perfectly cold, which required a few minutes only. In the meantime cacao butter with ten per cent. of Japan wax was placed in an evaporating basin. When melted, the molds were breathed into so as to coat the inside with moisture, after which the mold was filled with the grease melted and cooled just to point of milkiness. When cold, the finger was pressed gently upon the top of each suppository which would loosen with a little snap and then upon turning the mold upside down and gently striking a piece of wood, the suppositories would fall out. This made the unmedicated suppository.

A favorite prescription in those days was opium and extract of belladonna suppositories. With a powder such as opium all that was necessary would be the melting of the required number of plain suppositories, the addition of the powder, stirring the contents until the mixture cooled to a creamy consistence, when it was to be poured into the molds after the manner heretofore described.

a proper menstruum, then having melted the plain suppository and the softened extract, stir until reduced to a creamy consistence ; then adroitly with constant stirring pour the suppository mixture into the mold. One experienced in manipulation could make suppositories of any combination whatever very quickly by means of this method and these molds.

To the foregoing may be added a note concerning Dr. Chapman which may interest some of the members of our society. Dr. Chapman came to Cincinnati from Philadelphia, where he was born at Pannypack Hall (near Philadelphia), June 5th, 1813. He became a pharmacist at an early day. In 1834 he graduated from the Philadelphia College of Pharmacy, moved to Cincinnati in 1835, and in 1839 obtained the degree of M. D. from the Ohio Medical College. He joined the American Pharmaceutical Association at the second meeting in 1852. In 1872 he was elected professor of pharmacy in the Cincinnati College of Pharmacy, and served in the first Examination Board of Pharmacy of Ohio when a special law applied to Cincinnati.

Dr. Chapman was one of the most thorough pharmacists it has ever been my opportunity to meet. He was not a successful business man, preferring rather the manipulative and educational side of his art than the business department of his store. He neglected the customer for manipulative work, and often cut a patron short in order to attend to some detail concerning manipulation, his theory being that the pharmacist should make everything he used, at least everything possible. The result was that while Dr. Chapman was thus engaged in making these preparations and attending to the scientific part of his art, he was losing the good-will of his customers and finally their trade, the result being failure in a business way.

But with it all Dr. Chapman was a whole-souled, kind-hearted pharmacist, intent on doing well that which he had to do ; wrapped up was he to the extreme in his art. The result of such instruction as came from Dr. Chapman to the young men of the Cincinnati College of Pharmacy is evidenced yet in the thoroughness of many matured pharmacists of the west, to whom in those early days he was a teaching preceptor. He maintained an active interest in the American Pharmaceutical Association to the date of his death, corresponding constantly with such men as Procter, Parrish, Squibb, and the wheel-horses of the olden time.

The writer was applauded upon his paper.

MR. BERINGER: In connection with the subject of the early suppository molds, I have here some molds made of plaster-of-paris which were used as far back as 1840. They show the process of making suppositories by molds at that time, instead of by paper molds or by hand. They come from the Heinitsb store at Lancaster, Pa. Perhaps not many of the members know that Dr. Chapman was Recording Secretary of the Association in 1853, the second year of the Association.

I would like here to say a word in regard to early papers, a subject we have been considering. In looking over the old reports it is interesting to note the early attempts in



Bailey, who was drug inspector at New York. The following year there was a good report contributed to the Proceedings from the same source, and there has been preserved in the archives of the Association a letter from Dr. Bailey. At the same meeting at which Mr. Sharp read his paper, in 1855, there appear to have been only two papers by members, one by Edward S. Wayne on "The Growth and Production of Wines in the West," and the other by Mr. Sharp on "The Strength of Commercial Muratic and Nitric Acids and Alcohol." Some of these old-time papers are well preserved in manuscript form. I have one in my hand, written in 1857 by William Procter, Jr., entitled "Remarks on Ergot."

Mr. Beringer then laid the suppository molds and the paper by Mr. Procter referred to on the Chairman's desk, that the members might inspect them at their convenience.

Mr. HANCOCK: The molds exhibited by Mr. Lloyd bring back to mind the meeting of the Association in St. Louis in 1871, when the President of the British Pharmaceutical Conference, Mr. Henry Brady, attended there. He brought over with him a set of molds that he presented, at the meeting, and he brought also some samples of suppositories that were exhibited. He had some made of cacao-butter and some of glycerin jelly. I was, after that meeting, for some time in association with that gentleman, and he told me he had these molds made in London; said he had a "corner" on suppositories, and had the trade of the other pharmacists, and explained how he conducted this particular business. The molds were the most exquisite I have ever seen. I had him to send me a set after his return. I think it cost me \$125 for the set. They were made of gun-metal, silver-plated, and these molds are still in daily use. Of course they show wear, but they are the most perfectly made molds I have ever seen, and they were the most beautiful in finish. The sizes were 120 grains—with a minie-ball shape—60, 30 and 15 grains; and then the longer ones were two inches and a half, nearly, the cylindrical suppositories. But Mr. Brady explained to me about the cacao-butter. He said it was hard to get the proper kind to use in making suppositories, and he very earnestly objected to the use of any other substance—objected to the common use of wax, as being unnecessary if you had a good cacao-butter, and decidedly objectionable because of hardening the cacao-butter so as not to allow it to fuse as quickly as it should. He dehydrated his cacao-butter. He found that the cacao butter on the market was adulterated—or diluted—with water; that water they incorporated to make it heavier, and you can incorporate a great deal of water with pure cacao-butter. When I got my molds, I found the same difficulty he had described—I found that the cacao-butter of the market had a great deal of water in it, and that it interfered very much in the making of the suppository. But I followed his directions about exposing the cacao-butter, the best I could get, over heat until all the water was dissipated, and then I found it sufficiently solid not to require any more hardening than was to be found in its own composition. The molds were very fascinating to me, and after a little time I found out I could turn out a very nice suppository, and I found it unnecessary to blow the breath on the mold in the manner described by Mr. Lloyd. It is necessary, in order to make a pretty suppository, that the mold be perfectly clean and perfectly chilled. Then, of course, it is the proper thing to polish off the molds after you have taken them off the ice, so as to have all the condensation wiped off of it, and as quickly as possible you should be ready to pour in your cacao-butter. I have been surprised at the number of clerks who have come into my employ, who had served for a long time in the stores of Baltimore, and were not able to make a beautiful suppository; they confessed, many of them, that they

your molds are in proper condition; then, with proper care, you can turn out your suppositories every time with a beautiful polish over the entire surface. If you are careless, you will find sometimes one will have a beautiful polish and another will have that polish to break off, and it will show one very beautiful suppository and alongside of it one that has a rough surface. These molds, however, were different from those shown here; they were opened with a hinge at the bottom, and suppositories were removed without any trouble. It is necessary in making suppositories to first get a pure cacao-butter, and then to dissipate all the moisture that is in it, or have dehydrated cacao-butter; and then learn for yourself—because nobody can teach you—how to use the molds properly. [Applause.]

MR. HYNSON: We have been very glad to listen to Mr. Hancock's remarks on this interesting topic, but because of the limited time allowed us I move you, Mr. Chairman, that remarks on papers read be confined to three minutes hereafter.

The motion was put and carried.

The chair again called for the reading of Mr. Wilbur L. Scoville's paper on colognes and toilet waters, and Mr. Scoville presented his paper in abstract, calling attention to some bottles of toilet waters and colognes that he had placed on the Chairman's desk for examination by the members. The paper was as follows:

COLOGNES AND TOILET WATERS.

BY WILBUR L. SCOVILLE, BOSTON, MASS.

It is plainly apparent, to even the most superficial observer, that a considerable change has taken place in late years in the composition of commercial perfumes and toilet waters. This is due in part to improvements in the quality and variety of the volatile oils used, and to chemical investigations which have made close imitations of some of the most delicate odors possible by artificial means; but it is due even more to better methods of "fixing" the odors in the perfume, and to a decreased use of the animal fixing agents.

The secret of perfumery lies mainly in the choice of the fixing agents, *i. e.*, those bodies which intensify and hold the floral odors. The agents formerly employed were musk, civet and ambergris, all having a heavy and dull animal odor which is the direct antithesis of a floral fragrance. A free use of these bodies must inevitably mean a perfume which requires a label to tell what it is intended for, to say nothing of what it is. Such was the perfume of a dozen years ago.

To-day there is no evidence that the last of these (ambergris), is being used at all in the newer perfumes, and the other two are employed very sparingly, if at all. The result is that the newer perfumes possess a fragrance and a fidelity to the flowers that they imitate which is far superior to the older perfumes.

Yet the newer perfume is quite as prominent and lasting as the old, while it is more pleasing. It contains the synthetic odors, with balsams

A distinction should here be made between artificial and synthetic odors. Artificial odors are composed of natural constituents of volatile oils, separated by fractional distillation or other means, and newly combined to produce the desired odor. Such are artificial oils of rose, jasmine, tuberose, etc.

Synthetic odors are purely chemical products of definite chemical composition, such as vanillin, heliotropin, terpineol, synthetic oil of bitter almond, etc. The solid (or concrete) synthetic odors are all valuable as fixing agents, and are largely employed as such. Heliotropin, for instance, is one of the most powerful and persistent of fixatives, and whenever its odor will allow is employed for this end alone.

But it is for the purpose of drawing attention to the balsams, and particularly benzoin, as a fixing agent for colognes and toilet waters, that the present paper is designed.

The practice of using musk in these still prevails widely. It is a mistake. A cologne should be refreshing and invigorating. It has a positive therapeutic value in slow fevers, after surgical operations, etc., when it possesses these qualities. To the feverish patient, weary with the long lying in bed and tired of the smell of medicines, and in a room which seems stuffy, though it may not be, the application of a little muskless cologne to the face and hands is at once a bath and a change of atmosphere. Antipyretics may be more necessary in acute fevers, but they can never be so invigorating and cheering.

But musk is depressing, and its use in a cologne in even the minutest quantity will spoil the cologne for such uses. The first effects may be refreshing, but the musk lingers after the brighter odors have disappeared, and a sick patient is pretty sure to feel its effects. Persons in vigorous health will not notice the depressing effects of musk, but when lassitude prevails these are very unpleasant. Moreover, it is not a necessity in these toilet accessories, either as a blending or as a fixing agent. Its place is better supplied by benzoin for both purposes.

Only the best variety of benzoin, that known as Siam or vanilla benzoin, is suitable for this use. It costs five or six times as much as the Sumatra or marble benzoin, but the latter has a pungent and coarse quality and lacks fragrance. The best Siam benzoin is less expensive than musk. It is best employed in tincture made of the strength and by the method of the Pharmacopœia.

FORMULAS.

There is so much difference in individual tastes and in the demands of cost that it is not to be expected that any single formula for a class of odors will be accepted as ideal, or any set of formulas regarded as complete. There is no law in perfumery, but a few general considerations may

cases if not too rigidly interpreted.

Every toilet water, like a handkerchief perfume, should have a distinctive odor or quality. This is best secured by means of a few ingredients, carefully selected, and of the best quality. A formula which contains a dozen or so of ingredients, usually means either that the author employed poor oils and sought to cover the bad qualities of each by a liberal variety of qualifying oils, or that he made mistakes in his first selection for a desired blend, and sought to correct them in the same way. The simplest formulas are usually the best, so long as they contain the essentials. But they emphatically demand good materials.

This does not mean that one must pay the highest prices and secure the fanciest brands invariably, but only that a good quality, which can be secured only at a suitable price, is the cheapest in the end.

The quality of the oils is of more consequence than the quality of the alcohol. A lot of nonsense has been written about the necessity of extreme care in the selection of the alcohol for perfumes, such as certain kinds requiring alcohol made from grapes, and others demanding extreme purification, etc. A reasonable attention to a good quality of alcohol, even at a slight increase in cost, will always pay, but, other things being equal, a good quality of oils in a poor quality of alcohol will give far better satisfaction than the opposite combination. The unsophisticated public is not composed of exacting connoisseurs, and it does not appreciate extreme care or expense in either particular.

A good grade of pharmaceutical alcohol, reasonably free from heavy and lingering foreign odors, will answer practically all the requirements.

Distillation of colognes and toilet waters, so often directed, is another delusion and a snare. It is true that heat will hasten the blending of the oils and the ripening of the perfume, but it will be far better and easier secured by a gentle digestion than by distillation. In fact, distillation of these is more likely to work harm than good.

The problem of catering to the demand for cheap colognes and perfumes calls for a fine discrimination. The demand usually springs from an uncultivated taste, and may mean that the most vigorous odors are desired, such as sandalwood, rose geranium, verbena, etc. These may be employed in place of the softer lavender, rose and neroli oils, or a really nice but cheaper odor may be secured by reducing the oil and alcohol strength. Since alcohol is by far the greatest factor in expense of toilet waters, a reduction in alcoholic strength means almost a proportionate reduction in cost. Moreover, odors develop more quickly and stand out more prominently in hydroalcoholic than in alcoholic media, so the reduction of the oils in any of the following formulas to one-half the quantities directed, and the use of diluted alcohol as a solvent, with corresponding reductions in the benzoin, will produce odors which appear at first quite as strong as the originals, but whose permanence is lessened.

Perhaps the chief value of the following formulas may lie in the fact that they are here made public for the first time, yet it is hoped that some may find one or more of them of real value. The samples which are submitted will show what may be expected from them by the use of regular commercial grades of materials :

COLOGNE.

This resembles closely the popular "Farina" colognes usually sold in sealed packages.

Oil of bergamot.....	℥ iss.
Oil of lemon	℥ vi.
Oil of neroli	℥ iv.
Oil of orange	℥ ii.
Oil of rosemary	℥ ii.
Tincture of benzoin.....	℥ ii.
Orange flower-water	℥ xii.
Alcohol to make 1 gallon.	

This costs \$3.40 per gallon (July prices). The predominating odor is that of orange flowers. Other odors may be substituted for this if desired, the rest of the formula remaining as it is. For instance, a

LILAC WATER

or lilac cologne is made by substituting terpineol for the oil of neroli, as follows :

Oil of bergamot	℥ iss.
Oil of lemon	℥ vi.
Terpineol.....	℥ iv.
Oil of orange.....	℥ ii.
Oil of rosemary.....	℥ ii.
Tincture of benzoin ...	℥ ii.
Water.....	℥ xii.
Alcohol to make 1 gallon.	

Cost, \$2.90 per gallon. Not an ideal lilac water, but it is suggestive.

Or an antiseptic cologne having some of the fragrance of the pine woods, and particularly adapted for spraying a room, may be made with a slight variation as follows :

Oil of bergamot	℥ vi.
Oil of orange	℥ i.
Oil of rosemary.....	℥ i.
Eucalyptol	℥ ii.
Bornyl acetate.....	℥ ss.
Tincture of benzoin	℥ i.
Alcohol	Ovss.
Water.....	Oiiss.

Cost, \$2.05 per gallon.

twenty times as strong as the oil, is much more soluble, and has a delightful fragrance. The substitution of eucalyptol for oil of lemon increases the antiseptic qualities of this cologne, as well as develops the characteristic pine-woods odor in an improved degree.

If a headache cologne is desired, the addition of menthol and camphor to the first formula is all that is needed.

Menthol	§ iv.
Camphor.....	§ i.
Cologne (first formula)	Cong. i.

Cost, \$3.80 per gallon.

Some may prefer a larger proportion of menthol, but don't overlook the fact that too much will irritate the eyes unduly when it is applied to the face and head.

LAVENDER WATER.

This article is not as popular as it deserves to be, owing perhaps to variations in lavender oils. No oil is more variable than this, it being listed all the way from 50 cents to \$16.00 per pound. The sample was made with an oil costing \$1.65 per pound. A finer oil would not need the oil of orange to soften it.

Oil of lavender	§ iv.
Oil of bergamot	§ i.
Oil of orange	3 ii.
Oil of neroli	3 ss.
Coumarin	3 ss.
Tincture of benzoin	§ i.
Water	Ol.
Alcohol	Ovil.

Cost, \$3.05 per gallon.

Many formulas direct oil of rose to soften the lavender, but neroli has a much finer effect and makes the lavender more fragrant.

FLORIDA WATER

is simply a spiced lavender water. Spicy odors may be added to the foregoing, or the following, which is a little less pronounced in lavender odor, and may be preferred :

Oil of lavender	§ ii.
Oil of bergamot	§ i.
Oil of orange.....	§ ss.
Oil of neroli	3 ss.
Oil of cassia.....	3 i.
Oil of caraway.....	Mxv.
Oil of spearmint	Mxv.
Tincture of benzoin	§ i.
Water	Ol.
Alcohol	Ovil.

Cost, \$2.90 per gallon.

BAY RUM.

In spite of the legion of formulas for this article which shower down upon us continually, the so-called "imported" and "distilled" articles still hold a place. While a foreign label and an ugly bottle may have some charm, yet there is a softness and depth about these that the formulas usually fail to reproduce. So the "imported" article may have a real point of excellence.

But it is surprising how well this superior softness can be secured by employing a very little benzoin. It imparts a quality, if used sparingly, that is very agreeable, and that suggests the foreign brands.

The following formula is adapted from the Spiritus Myrciæ of the Pharmacopœia. It is weaker in alcohol and contains the benzoin.

Oil of bay	3 vi.
Oil of orange	3 ss.
Oil of pimento	3 ss.
Tincture of benzoin.....	3 iv.
Powdered orris root.....	3 iss.
Water.....	Oiv.
Alcohol	Oiv.

Cost, about \$1.55 per gallon.

The powdered orris root is employed chiefly as a clarifying agent.

The use of rum in place of a portion of the alcohol is a well-known improvement, but I have here preferred to let the formula emphasize the effect of the balsam; so I have not qualified it by the addition of an unknown element in the shape of a variable rum. Use a little good rum in the above formula, and it will be found difficult to distinguish the product from some of the best "imported" brands.

VIOLET WATER.

Courage fails me to attempt to discuss this vague and fickle thing. It contradicts all that was said about the refreshing qualities of a toilet water and the use of musk. It aims to be as *unlike* the flower as possible, hence its diversities are legion. Violet is a delicate odor, but the public wants something vehement and colored green. Why it should be green they do not know, but if it is green they know what is in the bottle after the label has been washed off. It is the almost numberless variety of odors that pass for "violet" that discourages comment. It would not be mentioned in this paper, were it not that the wide-spread demand must be recognized. This paper might be considered fatally deficient were it ignored.

Violet extracts and waters may be divided into two classes, those made with ionone, and those which depend upon a combination of rose, bergamot and sandalwood for a vague suggestion of violet. The only point of agreement is in the use of sandalwood and musk. Sandalwood is prominent in most of the violet perfumes, and some contain quantities of musk,

Plainly, violet is not adapted as a refreshing toilet accessory for persons not in vigorous health.

The combinations containing ionone may have a suggestion of the real violet odor. Ionone itself has a delicate odor, and a quality which can only be described as "thin," and it resembles the odor of violets only in part. It needs something to fill it out and give it "body" to become acceptable as a perfume. The most convenient single agent for this purpose is sandalwood, and the more of this the perfume contains the more certain is the user that "something smells." Ionone, though thin, is very extensible, Doubling the quantity does not double its apparent power. The art of its use lies in properly developing and backing it in a mixture. So almost any of the heavier and more prominent odors can be, and probably is, used in its combinations.

The following resembles, in a general way, a number of commercial violet odors, but it will never be mistaken for a bunch of violets :

Ionone	3ii.
Oil of sandalwood.....	3iv.
Oil of neroli.....	3i.
Oil of bitter almond	Mviii.
Oil of spearmint.....	Mxv.
Helliotropin	3i.
Musk (artificial preferred)...	gr. ii.
Tincture of civet	3iv.
Water	Oii.
Alcohol	Ovi.

Cost about \$4.75 per gallon.

In some of the popular "violets" the rose odor is very prominent, and combinations with rose are almost as common as ionone mixtures. In the cheaper grades rose geranium is used in place of rose, and the following is typical of this class, but the rose odor does not predominate :

Oil of sandalwood.....	3iv.
Oil of bergamot.....	3iv.
Oil of rose geranium (Algerian)	3ii.
Oil of neroli	3i.
Oil of bitter almond	Mxv.
Musk (artificial or natural).....	gr. i.
Tincture of benzoin	3iv.
Powdered orris root	§ ii.
Water	Oiii.
Alcohol	Ov.

Macerate 30 days and filter.

Cost about \$2.20 per gallon.

The samples are colored with just a trace of green dye—not enough to leave a stain.

Violet, more than any other odor, needs time to develop. Ionone disappears entirely when first added to alcohol, but after a few days it begins to show its presence, and it continues to develop for some time. Most of the published formulas direct excessive quantities of ionone, and the result may be unsatisfactory, while the cost is prohibitive. Oil of orris may be used in place of ionone, using about eight times as much.

The second mixture is, in some respects, so incongruous and contradictory that it too needs a number of weeks to blend. Oil of rose (in smaller quantity) in place of oil of geranium, will make a softer and more fragrant water.

Finally, remember that all perfumes require time to blend and ripen. Six months should be allowed for blending whenever possible. An economical way of securing a constant stock of well-ripened waters is to blend the oils in quantities, one to a dozen years in advance, without alcohol, and then when the cologne or toilet water is wanted add the proper quantity of oil mixture to the alcohol and water, and set in a warm place for three to six weeks. Then it will be found ready for use.

THE CHAIRMAN: Gentlemen, the time has now come for the nomination of a Chairman and Secretary of this Section. Are there any nominations for those offices?

MR. REMINGTON: I come before the Section to nominate for Chairman a man in every way fitted for the place and eminently deserving. I believe this is the first time I ever appeared before a Section to make a nomination for Chairman, and I do it in this case because I desire to see, if possible, this Section elect a man next year who has not sought the position, but one whom I feel many of you will be glad to see as Chairman nevertheless. I allude to George M. Beringer, of New Jersey. Mr. Beringer has been Chairman of the Committee on Semi-centennial Celebration here, and he is in every way fitted for this position. He is a pharmacist of long experience, as you know, and has always paid particular attention to dispensing and prescription work. I therefore present the name of Mr. George M. Beringer for Chairman.

MR. WHELPEY: I take great pleasure in seconding this nomination. I have learned during my administration that Mr. Beringer is a man who does exceedingly well whatever he undertakes, and I feel that his special qualifications and adaptability for this kind of work will inure to the benefit of the Association, as well as this particular Section of the American Pharmaceutical Association.

THE CHAIRMAN: If there are no further nominations for Chairman, we will receive nominations for Secretary.

Mr. Schlotterbeck nominated Mr. W. K. Burke, of Michigan, and Mr. Mason seconded the nomination.

MR. HYNSON: Mr. Chairman, I am very glad to see young men nominated for office, and I propose the name of Mr. H. A. B. Dunning, of Baltimore, for Vice-Chairman.

The Chairman announced that the nominations would go over to the next session, under the rule.

The chair then called for Mr. Dunning's paper on aromatic waters, and

AROMATIC WATERS.

BY H. A. BROWN DUNNING, BALTIMORE, MD.

It is not intended through this paper to inform the pharmacists of a new method for making aromatic waters, but to offer them an opinion on the best method in general use.

Of three methods in mind, that with precipitated calcium phosphate is most widely used ; probably because recommended by the Pharmacopœia, is readily applied and yields a clear, strong solution of the respective oils. But, in the writer's experience, waters made by this process become somewhat musty and opalescent on standing.

Another method used to some extent, is one in which purified talcum is used. Commercial talcum or impure magnesium silicate freed from traces of aluminum, iron, etc., by treatment with hydrochloric acid according to the directions under "Talcum purification," National Formulary, is the chemical to which reference is made.

The last of the three methods may be called the filter paper method ; the water being made by the exposure of the oil to distilled water by the aid of filter paper. The "modus operandi" being to drop the oil on a mass of picked or shredded filter paper, then to drop the oily paper into the required amount of warm distilled water contained in a bottle or jug, quickly stoppering. Set aside with frequent agitation, preferably, during several days. When desired for use filter through a filter paper, properly folded, with the point resting in a pledget of absorbent cotton, placed in the neck of the funnel. The result will be a perfectly clear water of a clean, strong odor of the particular oil used.

The object of this paper is to advise all pharmacists to use the last mentioned method.

Let us consider the advantages and disadvantages of these several methods.

The precipitated calcium phosphate method has no advantage over the other methods in preparation, and leaves a water contaminated with traces, and often more than traces, of phosphate, chloride and sulphate, as is proven by analysis. This is due to the calcium phosphate, as the commercial precipitated calcium phosphate is usually contaminated with these impurities.

To readily obtain a clear filtrate more of the calcium phosphate is required and is used by many pharmacists than is directed by the Pharmacopœia. Of course, the more impure calcium phosphate used, the greater the contamination of the water.

Purified talcum answers the purpose much better than the calcium phosphate (not purified), as all of the impurities, soluble and insoluble,

have been retained, yet, it is a great amount of trouble to purify talcum, and the commercial article, like calcium phosphate, contains impurities, yet not of the kind to cause as much trouble in the general use of aromatic waters.

Why should the pharmacist be bothered with even an occasional unsightly mixture due to impure calcium phosphate, or why should he be obliged to take the time to purify talcum to aid in the filtration of aromatic waters, when there is no necessity for using these chemicals?

The filter-paper method will give a water with a cleaner and stronger flavor and will remain so; not becoming musty as do the waters of the other two methods.

While the writer was using the precipitated calcium phosphate method there were many cases of annoyance caused by the above-mentioned impurities of the phosphate. Some two or three remembered, are here mentioned.

On several occasions a physician ordered and waited for a mixture of equal parts of peppermint and lime waters. Upon mixing the two waters a flocculent precipitate formed; this was removed by filtration, but the precipitate continued to form. Meanwhile, the physician was out of patience.

Another annoying occurrence was in a prescription for :

Diuretin	$\text{℥ } \frac{1}{2}$.
Peppermint water.....	$\text{℥ } \text{iv}$.

A very heavy precipitate was caused; the mixture was thrown away. Diuretin costs \$1.80 per ounce.

Fowler's Solution also causes a precipitate with the waters made with calcium phosphate.

There are other instances; yet, if there were only these, they should be sufficient to cause us to use the water which produces no incompatibilities.

Mr. Dunning also read the following paper on Phosphorus Resin :

PHOSPHORUS RESIN.

BY H. A. B. DUNNING, BALTIMORE, MD.

The manipulation of phosphorus for prescription use is certainly one of the pharmacist's difficulties. Being prescribed only in small quantities, fractions of a grain usually, it needs must be diluted to facilitate weighing and incorporation.

Because of the tendency of phosphorus to oxidize at ordinary temperature, it can not be mixed with a diluent in the open air.

For the pharmacist there are two points to consider in the use of phosphorus, viz., to avoid exposure to air and to use a proper diluent.

In the process of making phosphorus pills according to the Pharmacopœia, the phosphorus is dissolved in chloroform, the solution poured

pills, apparently, this method is satisfactory ; but for making small quantities, as twelve, or with pills or capsules containing other ingredients also, the method is too tedious and hardly satisfactory.

If phosphorus could be mixed with ordinary resin, so that the pharmacist could feel confidence in its thorough distribution, it would offer means for simplifying the method of the Pharmacopœia. By the use of this resin sufficient absorbent powder and honey would be all that is necessary. Coat with tolu as usual.

Phosphorus resins as ordinarily made are not very satisfactory. They are usually made by weighing the required amount of phosphorus under water, quickly drying between filter paper and dropping into a weighed amount of resin or balsam tolu contained in a bottle. The mixture is then heated, fused and shaken until cool.

But the resin and the tolu are unsatisfactory because they fuse at too high a temperature, above 100° C., and when fused the material is so viscid that the operator can not be satisfied that the phosphorus is thoroughly distributed through the mass by shaking. Besides, there is some risk incurred by subjecting phosphorus to such high temperature as is required to fuse the resin or balsam.

Another suggestion that has been offered, is to place a weighed quantity of phosphorus in hot water, contained in a wedgewood mortar of sufficient size, drop in a required amount of resin and knead the fused phosphorus and softened resin thoroughly.

The required properties of a solid substance to mix with phosphorus for this purpose are that it should fuse at the temperature obtained by use of the water bath ; the fused materials become and remain sufficiently fluid, at that temperature, to permit of the thorough distribution of the melted phosphorus and, at a somewhat lower temperature, become viscid and finally of a consistence hard enough to allow the mass to be cut into small pieces of convenient size without sticking.

The following formula, it is thought, will come pretty close to these requirements :

Oil of sweet almond.....	1 part.
Resin	8 parts.
Yellow wax	2 parts.

Melt the resin by the aid of direct heat, add the yellow wax and remove from the fire, add the oil. Strain sufficient of mixture, while stirring into a strong wide-mouthed bottle of such size as to prevent it being more than three parts full, and then allow to become cool. Weigh the phosphorus, four or ten per cent., under water, dry with filter paper and drop into bottle containing cold resin mixture, then quickly cork and tie down

with twine. Place the bottle in a water bath, so that it will not rest directly upon the bottom, and heat water gradually to boiling. Continue the boiling until contents are quite fluid. Now shake until satisfied that the phosphorus is thoroughly distributed; continue the shaking until the contents of the bottle become too viscid to shake. If desired the above may be repeated.

After the now finished product has become entirely cold, the bottle is to be broken, the mass freed from adhering glass, cut into small pieces, placed in a stock bottle and covered with water to prevent oxidation.

The quantity representing the amount of phosphorus desired can be easily and carefully weighed without loss of phosphorus, and may be incorporated into pill masses with ease and certainty, as substances of like physical character are usually incorporated.

The Chairman said, discussing the paper just read, that the first paper he ever wrote for the American Pharmaceutical Association was on phosphoretted resin, and that his method was to select the phosphorus and put it in a wide-mouthed bottle—taking 900 grains of resin, powdered or broken up, and 100 grains of phosphorus—cork the bottle well and put the two in a sand-bath until melted; then take it out and wrap it up in a big towel and let it stand until cold. Four ounces of it would last him a year.

MR. DUNNING: The objection to that method is, it is likely to crack the bottle. If the bottle should break, the phosphorus would ignite more readily. The advantage of this method is that it is perfectly fluid, and it can be shaken thoroughly with the phosphorus. This mixture can be made with the aid of a water-bath.

THE CHAIRMAN: I think the suggestions made very good.

MR. DUNNING: The object is to get something that will fuse at a low temperature—that is the main object. It is not intended to suggest that it is something new at all.

THE CHAIRMAN: Mr. Kaemmerer has a paper that will fit right on this paper, on the subject of talcum and calcium phosphate.

Mr. Hynson moved, in view of the fact that members were leaving the room in order to get ready for the boat-ride this afternoon, that the Section should now adjourn until to-night at 8 o'clock. The motion was seconded and carried, and the Section then adjourned.

SECOND SESSION—FRIDAY EVENING, SEPT. 12, 1902.

The second session of the Section on Practical Pharmacy and Dispensing was held in Horticultural Hall, Broad street, and was called to order at 8:30 p. m., with Mr. Geo. W. Sloan in the chair.

Mr. Hynson moved that the Section now continue consideration of the paper on "Contributed Pharmaceutical Notes," edited by him, which had

of papers by gentlemen who could not attend the evening session. He thought he could suggest this with perfect good taste, as the matter was not his, but contributed by others and merely edited by him. This order was agreed to, and Mr. Hynson took up one at a time the various notes on prescriptions and dispensing contributed by different members, and invited the asking of questions and informal remarks as he went along. The paper was disposed of in this manner, and elicited considerable informal discussion and the asking of questions to and fro between the members as the various items were read. The full text of the paper was as follows :

CONTRIBUTED PHARMACEUTICAL NOTES—ARRANGED FOR THE COMMITTEE ON PRACTICAL PHARMACY AND DISPENSING.

BY HY. P. HYNSON.

Because of the resignation of the Chairman, the remaining members of the Committee have requested me to arrange and classify the notes received, through the envelopes, from members of the Association.

One with ordinary ambition would wish, on this occasion, so important in the history of American pharmacy—the world's pharmacy, in fact—to present something fairly creditable. Yet, in the position of a substitute, and lately impressed substitute at that, it is most difficult. Kind friends will expect but little, and critics will be disarmed.

The pessimist and fault-finder ; he who is as ignorant of what was as he is out of touch with what is, will find nothing of encouragement in these limited notes, bearing, as they do, the sign manual of the shop ; but the true historian of pharmaceutical progress will discover in them something to make him even happier in our glorious jubilee days. Something that should stimulate us to strive with might and main to elevate the masses in pharmacy ; stimulate us to make sure the foundation is broad and good, while less time is spent in gilding the dome and in pushing the spires still higher ; these are, of themselves, quite conspicuous enough and stand in good stead as standard makers.

Balances, on the resistless wheel of progress, are they who can not note its advance, even though they, *nolens volens*, are carried with it. Useful, but not ornamental, they hang in place and, although they try with all their might to prevent the turn, the wheel goes on, on with the force that carried our fathers in their work of organization ; on through the beginning and its trials of civil strife ; on to uncertain days ; on, again, to prosperous times ; on to our golden jubilee.

We speak of retrogression, of degeneracy, when one knows, because he simply does know, without added proof or fair comparison, that his storehouse is better filled with helpful things than when he began actively some thirty years ago ; his store is larger because it had to hold more, newer and

general literature and greater dissemination.

To-day the scientific pharmacist is trying hard to keep pace with scientific medicine; the commercialist is on his mettle to make the greater contest sure; the educator, by precept and by law, is hard pushed to win comparative recognition; while the actual compounder and dispenser never before had greater need for quick and accurate judgment, sound and ample training or facile and polished technique. This is true in this our day of rejoicing; it is but just to our organization. Great, indeed, is our Association, the American Pharmaceutical.

It must not be thought that the notes, which have been so kindly sent to the Committee, always, or even often, present something new or original. They are, however, just what has been asked for; they are observations which will, no doubt, be helpful to quite a number. We are not looking after the ninety and nine fortunate ones, but are striving to help the stray one or two who have not been so kindly favored. Many of the notes will be more helpful because of much incomplete and imperfect indexing, in general pharmaceutical literature, and because, sometimes, great writers can not descend to the commonplace.

These notes, as will appear, have been divided into several classes as follows: general, synonyms, prescriptions, sub-titles, fluids, capsules, ointments and suppositories.

GENERAL.

Silver nitrate which has become discolored by exposure may be easily reclaimed by recrystallization and with comparatively little loss.

The fact that Goulard's Extract may be mixed with distilled extract of witch hazel which has been exposed to carbon dioxide, without cloudiness, is peculiar, and needs explanation.

To the question "What is meant by 16°, 20° and 26°, in reference to the strength of aqua ammoniac?" it may be stated that this refers to an estimation by the hydrometer, Baume's scale, and that these several strengths indicate ammonia water of 10, 20 and 28 per cent.

The precipitate occurring from cocaine hydrochloride dissolved in presence of both boric and salicylic acid, heretofore reported, is due to the formation of cocaine boro-salicylate, an insoluble salt. The boro-salicylates of all the principal alkaloids are of the same character, and this applies to the solution of cocaine in antiseptic preparations containing both salicylic and boric acid.

Because of the greater solubility of the salicylate, salicylic acid is greatly to be preferred to boric acid for the preservation of cocaine solutions. Boric acid, after long standing, causes a precipitate of the borate from cocaine solutions.

It will be found convenient to keep on hand a saturated solution of salicylic acid, in distilled water, in which to dissolve cocaine hydrochloride. Such solutions will keep indefinitely.

occur because of the several formulas to be found in standard publications. Battey's formula calls for one part of iodine and two parts of carbolic acid to be fused together. This is a solid during cool weather.

Mercury benzoate, like the chloride, is made much more soluble by the addition of sodium chloride. Useful knowledge is this in the preparation of solution of mercury benzoate for hypodermic use.

Caffeine will be found readily soluble in solutions of sodium salicylate or sodium benzoate.

The turbidity in solutions of alkaline bromides and iodides in aromatic water may be cleared up by substituting about twelve or fifteen per cent. of distilled water for that quantity of the aromatic water prescribed, the distilled water to be added after the solution of the salt has been made in aromatic water.

The undesirable and inconvenient solidification of heavy mixtures of calcined magnesia and sodium bicarbonate may be largely prevented by hydrating the magnesia beforehand and allowing it to harden and dry. Afterwards make mixture with the powdered hydrate.

Commercial borax will be found to contain many crystals of sufficient size to largely retard the solution of the salt. If found to be sufficiently pure for prescription use it may be bolted, otherwise each quantity should be finely powdered before the solvent is added.

The corrosive action of carbolic acid on the skin may be almost completely overcome by the liberal application of strong alcohol.

It is out of date to continue the use of labels recommending oil as an antidote for carbolic acid. Alcohol should be advised.

Salol dissolves in castor oil, in fair proportions, with the aid of gentle heat, but is thrown out upon cooling. This means, however, may be used for filling soft elastic capsules with the combination, keeping the solution sufficiently warm until introduced into the capsule, when upon cooling the salol will be deposited.

Castor oil, when flavored with saccharin, becomes faintly reddish upon standing some time.

Infusion of digitalis when made with cinnamon bark, U. S. P. 1880, will precipitate alkaloids as tannates; particularly strychnine sulphate, which is occasionally prescribed in this combination. The 1890 formula makes a clear, permanent solution with strychnine salts. Cinnamon bark does not add to the color of the infusion as might be supposed. The coloring matter is insoluble in water.

The dispensing of compressed chocolate-coated tablets of quinine on a prescription calling for "chocolate quinine tablets" elicited a strong protest from the prescriber, who maintained that the lozenge or tablet made from quinine and chocolate mass should have been furnished. They were for a child, who could not swallow the tablets, and were to be eaten; the

chocolate masking the bitter taste. Here is a fine distinction, which can only be settled by some official definition of these titles, employed rather promiscuously to designate the various forms of dry medication. See "Dry Medication," Merck's Report, July, '01; W. D., Aug., '02.

Where the number of capsules is not greater than required for dispensing a prescription (5—50) the simplest and quickest method is to place the shell of the capsule in a box-cover, resting on an incline, and the caps on a wetted filter paper on a pill tile. The oil or liquid is dropped into each capsule from a pipette or preferably from a dropping flask (Salleron's), inserting the tube into the shell and withdrawing when sufficiently filled; there is no danger of the outside becoming soiled with oil. The cap pressed into the wet paper, if necessary, is now pressed down over the shell and the capsule placed in the box-cover in an upright position for a few minutes. The leakage by this method does not exceed two per thousand.

A pill machine is for rounding the pills as well as for forming the roll or "pipe" and cutting it. If the roll completely fills the gutter, when laid in it lengthwise, the pill may be formed perfectly round when cut and rolled with a gradually pressing down and back motion of the cutter. A properly constructed pill machine is made on mathematical principles to insure this result. A pill machine should never be washed with water; simply wiped with a wet cloth.

The proper vehicle for carbolic acid ointment is unquestionably petrolatum. But even the crystallized carbolic acid is not retained in solution to the extent of 5 per cent. Perhaps the 3 per cent. carbolized vaselin is the limit. By liquefying camphor in carbolic acid the latter remains permanently in solution in the petrolatum to the extent of 4 per cent. Formula, camphor 1, carbolic acid 4, petrolatum to 100. "En passant" if the patent on the process for producing vaselin has expired years ago, such expiration carries the title in vaselin as a trade mark with it. Why not adopt vaselin as the name instead of the unpopular petrolatum?

No matter how thoroughly levigated with the finest zinc oxide the ointment (prepared with benzoinated lard, the proper vehicle) will, after a short time, show agglomerated particles. This is due to the affinity of the fat and oleic acid for the zinc oxide, and may be prevented by the addition of 1 or 2 per cent. of oleic acid to the vehicle, previous to the levigation, the completeness of which may also be assured by letting the melted mixture of lard and oxide pass through a strainer of cheese-cloth.

There is no need for a process for sterilizing lard except as comprised in its preparation and benzoinating. Lard which requires sterilization should be subjected to the direct heat or the flames of a furnace. The process for rendering or preparing lard or for benzoinating should include the process for its sterilization, which is now done in dehydrating it. After the lard has been sterilized it *must be kept sterile* by putting it in sterile

containers and keeping it at a low temperature, free from exposure to the air.

Coating suppository moulds with soap liniment has been suggested as a successful means of insuring successful removal of the suppository.

Suppository masses from which, by accident, extracts have been precipitated, may be reclaimed if reheated after a few drops of water have been added. This does not apply, however, when tannic acid is present.

Potassium acetate throws down a green precipitate from infusion of digitalis, 1880, but none from the present official preparation.

Loss of alcohol in filtration may often be avoided and satisfactory results obtained by using absorbent cotton as a filtering medium instead of paper. Especially is this so of spirit of peppermint.

Caution is given against the too long keeping of Brown Mixture. Besides the early decomposition of the spirit of nitrous ether, the small amount of sugar present may ferment. The formula of the late C. S. Tilyard is highly commended. It may be found in Caspari's Treatise.

Ammoniated tinctures should be carefully preserved ; they are best kept in small, well-filled bottles.

The A. C. E. anæsthetic mixture, alcohol 1 part, chloroform 2 parts, ether 3 parts (all by volume), may be memorized by the jingle—

“ A. C. E.,
One, two, three.”

Caramel should be tested as to its acidity or alkalinity, as it may be either, according to the manner of preparation. Unexplained difficulties often may be laid at caramel's door.

“Lead water,” “sugar of lead water,” “liq. plumbi,” “liq. plumbi acetat.,” and “liq. plumbi sub-acetat.” are confusing terms and need to be discussed and explained.

Compound tincture of lavender had better not be dispensed in hair tonic, even if so prescribed. A veritable “red-headed woman,” in consequence, is not a pleasant thing to meet.

Acid solutions of pepsin will decompose sodium salicylate, liberating salicylic acid, which, if in excess, will be thrown out of solution.

The discoloration of Donovan's Solution may be prevented by keeping a large globule of metallic mercury in the bottle holding the solution.

Oxalic acid acts destructively upon some forms of enameled ware. Loss may be avoided by using other kinds of vessels for solutions of this acid.

There is considerable call for Ingal's Suprarenal Solution, which takes a good deal of time to prepare. Sterilization has been tried and so far it has been found to answer admirably. It should be kept in one-ounce bottles. Some thus kept for over two months is now still in perfect condition.

Pharmacists should not overlook the fact that the taste of impure carbolic acid is far more objectionable than the pure, and for this reason, if a better one is not recognized, it should never be used for internal medication.

Pyrogallic acid is so very sensitive to light that special care must be exercised in dispensing it. It cannot be used for ointment without suffering almost immediate discoloration.

The bad practice of pasting one label over another until sometimes as many as six of various import appear on one bottle is still occasionally used. Besides being a very untidy practice, it is, obviously, a dangerous one.

An excellent appliance upon which to fold powders is a double pyramid of hard wood with equal rectangular surfaces, arranged to make four different sized powders, as illustrated by accompanying sketch.

CONTRIBUTED SYNONYMS.

"Oil of baize"	Mercurial ointment.
"Treacle"	Molasses.
"Treacle, chloroform et morphia"	Chlorodyne.
"Soda super carb"	Sodium bicarbonate.
"G. foetida"	Asafoetida.
"Bismuth trisnitrate"	Bismuth subnitrate.
"Tartrate of antimony"	Tartar emetic.
"Pulv. antimonialis"	James' powder.
"Diosma crenata"	Buchu.
"Emp. epispasticum"	Cantharidal plaster.
"Emp. lyttæ"	Cantharidal plaster.
"Secale cornuti"	Ergot.
"Chloroformyl"	Chloroform.

"Oleum jecoris aselli"	Codliver oil.
"Hydrargyri protochloridum"	Calomel.
"Plasma"	Glycerite of starch.
"Nux moschata"	Nutmeg.
"Elixir vitriol"	Aromatic sulphuric acid.
"Axungia ppt."	Prepared lard.

The following prescriptions were sent to the committee for criticism and comment. Many notes regarding them are from the senders and while not vouched for by the editor, they may, so far as he knows, be relied upon :

LIQUIDS.

Arsenous acid	gr. $\frac{1}{2}$.
Sodium bromide,	
Ammonium bromide,	
Potassium bromide, of each	3 ss.
Elixir of ammonium bromide	3 i.
Water enough to make	3 vi.
Boil the arsenic in the solution of bromides until dissolved, then add elixir. Mix solutions.	
Strychnine sulphate	gr. $\frac{1}{3}$
Aromatic spirit of ammonia	3 i
Tincture of strophanthus	3 iss
Water sufficient to make.	3 iv.

By adding the strychnine sulphate to the mixture of the alcoholics, the precipitated alkaloid is immediately redissolved, and the solution can be further diluted with the water without precipitation.

Tincture of ferric chloride	3 i.
Potassium chlorate	3 i.
Glycerin	3 i.
Cinnamon water	3 iii.
Mix, make solution.	

The glycerin prevents the precipitation of ferric oxide, which would fall were the glycerin not present.

Morphine sulphate	gr. vi.
Boric acid	gr. vi.
Sodium carbonate	gr. viii.
Water	3 i.
Mix and make eye water.	

The precipitation of morphine may be prevented by rubbing the borax with a half drachm of glycerin, then adding the boric acid and morphine sulphate and, finally, the water.

Spirit of chloroform	160 drops.
Sodium bromide	160 grains.
Spirit of nitrous ether	3 ss.
Water sufficient to make	3 ii.
Acacia sufficient.	
Mix.	

Dispense without acacia. Dissolve sodium salt in water, and add spirits previously mixed. Clear solution will result.

Potassium citrate	℥ ii.
Spirit of nitrous ether	℥ iii.
Tincture of belladonna	℥ iss.
Water enough to make	℥ iv.
Mix and make solution.	

As the potassium citrate is insoluble in alcohol, it is suggested that water sufficient be added to make an 8 ounce mixture. In this the salt will dissolve. Double the quantity of liquid originally directed to be taken must be given and the doctor notified.

Erythroxyline muriate,	
Antipyrine,	
Menthol, of each	gr. v.
Phenic acid	gr. ii.
Liquid albolene.....	℥ ii.
Mix and make spray solution.	

Cocaine hydrochloride is supposed to be wanted and the alkaloid must be used, as the hydrochloride is not soluble in liquid petroleum (white petroleum oil) ; as antipyrine is also insoluble in this product and is incompatible with carbolic acid, the antipyrine was omitted and the physician notified.

Acid hydrochloric dil.....	℥ iii.
Wine of aloes.....	℥ ii.
Water enough to make	℥ iv.
Mix and make mixture.	

As a heavy precipitate formed in a lump in the bottom of the bottle, one fluid ounce of glycerin was added instead of that much water, and a fairly good mixture resulted.

Ammonium chloride	℥ ii.
Fluid extract of grindelia robusta.....	℥ ss.
Syrup of tolu.....	℥ iss.
Syrup of wild cherry.....	℥ i.
Mix.	

Ordinarily a small quantity of water may be added to facilitate the solution of large quantities of such salts in syrup, but water in the presence of salts of the alkalies causes cloudiness when added to syrup of wild cherry. In this case the chloride should be dissolved in the syrup of tolu by the aid of gentle heat and when cold, the other ingredients should be added.

Bromoform	32 minims.
Alcohol (90-95 per cent.)	f. ℥ ss.
Glycerin, enough to make	fl. ℥ i.
Mix by dissolving bromoform in alcohol and adding glycerin.	

The above is reported as making a clear, permanent solution, containing four minims of bromoform in each fluid dram.

Castor oil	f. $\frac{3}{4}$ i.
Powdered sugar,	
Powdered acacia, of each	$\frac{3}{4}$ iss.
Brandy.....	$\frac{3}{4}$ ii.
Syrup of raspberry.....	$\frac{3}{4}$ ii.

Emulsify oil by using two drachms of acacia and four fluid drachms of water, omit sugar and add brandy and syrup.

Half drachm of acacia and two fluid drachms of water are said to be sufficient, but these quantities appear to be too small.

Holocain	gr. $\frac{1}{2}$.
Castor oil.....	$\frac{3}{4}$ ii.

Mix and make eye-drops.

The hydrochloride being the only salt obtainable, this should be dissolved in about 3 drops of alcohol, and the oil thoroughly rubbed into it; resulting in a clear permanent solution. The physician's fear that the small quantity of alcohol might be irritating, seemed unfounded. The salt is not soluble in castor oil—hot or cold.

Sodium bicarbonate	gr. xv.
Ammonia muriate.....	gr. x.
Castor oil.....	$\frac{3}{4}$ ii.
Simple syrup	$\frac{3}{4}$ vi.
Syrup of tolu,	
Water,	
Peppermint-water, of each	$\frac{3}{4}$ iv.

Mix.

The oil may be emulsified by using half a drachm of powdered acacia and one drachm of water, and after adding the syrups, the sodium bicarbonate should be added, dissolved with another half drachm of acacia in the balance of the water and peppermint water.

The correspondent was advised that an emulsion was not wanted, so he proceeded to dissolve the salts in the water, with which solution he "saponified" the oil and made mixture by adding syrups.

Balsam copaiba,	
Spirit of nitrous ether,	
Tinct. of cubebs,	
Paregoric, of each.	$\frac{3}{4}$ ss.

Add mucilage of acacia, mix and shake well, and use one teaspoonful 3 or 4 hours apart.

As no quantity of mucilage is ordered and the quantity of finished product desired is not indicated, recourse to the physician seemed the

only way out of this difficulty. Without the acacia the mixture is often prescribed, and is expected to be dispensed simply as a "shake up." The addition of solution of potassa as suggested by the correspondent seems hardly justified; indeed, the saponification of oils and resins, without the sanction of physicians, is ill advised.

Manganese oxide.

Gold and sodium chloride, of each 1 grain.

Glycerin 100 minims.

Mix; make solution.

Dissolve the salts separately each in the smallest possible quantity of water (about two drops), add half of glycerin to each and mix two solutions, a clear solution results; but if mixed together and dissolved a "murky" liquid results.

Zinc sulphate gr. iii.

Sodium biborate gr. x.

Rose water ℥i.

Mix and make eye solution.

Zinc sulphate gr. i.

Sodium borate gr. vii.

Camphor water ℥ii.

Water enough to make eye solution.

Either of the above prescriptions may be dispensed by adding very small quantities of glycerin to the borax before it is dissolved; one-half drachm or less will be sufficient. It is not necessary to omit borax or to substitute boric acid for it, as suggested by a correspondent.

Sodium salicylate ℥v.

Potassium iodide..... ℥iiss.

Wine of colchicum seed..... ℥iiss.

Tincture of digitalis ℥iiss.

Tincture of citro-chloride of iron ℥iss.

Glycerin ℥ss.

Water sufficient to make ℥iv.

Except when a large excess of glycerin is used, this produces a heavy gelatinous precipitate, which however may be readily dissolved by the addition of a few drops of water of ammonia, which enters into combination and cannot be objectionable. A clear salicylate-of-iron-colored solution results.

PILLS AND CAPSULES.

Extract of belladonna,

Extract of aconite,

Powdered opium, of each gr. ii.

Quinine sulphate..... gr. xx.

Camphor gr. x.

Mix and make 20 pills.

to use Castile soap as suggested. Indeed, soap should never be used if it can possibly be avoided, unless prescribed. After being powdered, camphor may be made into excellent pills with confectioner's glucose.

Quinine valerianate.

Iron valerianate.

Ammonium valerianate of each 15.

Mix and make 30 pills.

This illustrates the danger and oft-occurring error in writing and reading metric prescriptions. Evidently one and one-half grams of each was intended.

Potassium iodide.....	3i.
Mercury biniodide.....	gr. i.
Powdered extract of gentian.....	gr. x.
Powdered charcoal.....	gr. xx.

Mix and make 20 capsules.

This is an unusual combination. The question to be decided is: Shall the two iodides be rubbed directly together with the consequent results, or should they be kept as far apart as possible? It would seem to make but little difference so far as the therapeutic effect is concerned.

Calcium sulphide.....	gr. ʒ.
Dionin.....	gr. ʒ.
Heroin hydrochloride.....	gr. ʒ.
Oil of eucalyptus.....	2 drops.
Terpin hydrate.....	gr. i.
Glycerin.....	5 drops.

Mix. Make one capsule. Dispense 20 such capsules.

It was thought advisable to rub the oil of eucalyptus up with starch, $\frac{1}{4}$ grain for each two drops. Omit glycerin and dispense dry.

Oil of cubebs.....	3i.
Oil of copaiba.....	3iss.
Salol.....	3i.
Pepsin.....	gr. xxx.

Mix and make 30 capsules.

A satisfactory way of putting this up is to dissolve the salol in the mixed oils, make the quantity up to a simple multiple of minims. Add a proper quantity of this solution to a grain of pepsin, already in each capsule, and close. As the pepsin under certain conditions digests the gelatin capsules, it is a good plan to introduce it as a sugar-coated tablet, which is the practice of the larger manufacturers. Elastic capsules are to be preferred. This is about the same as the compound salol capsule formulated by Dr. William White, of Philadelphia, and largely known as "White's Capsules."

Creosote carbonate..... .. Div.
 Quinine sulphate..... .. Div.
 Caffeine citrate gr. x.
 Mix and make 20 capsules.

Licorice powder or starch will be found much more satisfactory for stiffening this mass than is tragacanth or elm bark. These latter, although largely used, are really objectionable in many masses, regarding their solubility or disintegration and their handling. These notes apply with equal force to the two prescriptions next following :

Thymol 3 ss.
 Phenacetin 3 ss.
 Calomel..... gr. ii.
 Extract of gentian sufficient.
 Make 12 capsules.

Apiol..... 3 iss.
 Manganese binoxide. 3 iss.
 Iron sulphate, dried 3 iss.
 Strychnine sulphate gr. $\frac{1}{2}$.
 Extract of digitalis gr. viii.
 Quinine sulphate 3 i.
 Mix and make 30 capsules.

Phosphorus gr. $\frac{1}{3}$.
 Quinine sulphate,
 Iron pyrophosphate, of each..... 3 i.
 Strychnine sulphate gr. ss.
 Extract of gentian sufficient.
 Mix and make 30 capsules.

The phosphorus was dissolved in ether and massed with the aid of althæa root. Chloroform is a less dangerous solvent for phosphorus. Eight grains of a four per cent. resin would have been found more satisfactory. Scale salts of iron should be very finely powdered before being massed for pills.

Potassium iodide 3 i.
 Biniodide of mercury..... gr. iii.
 Glycerite of starch,
 Cacao butter, of each sufficient.
 Make 48 capsules.

If the glycerite and cacao butter are used the capsules can not be made to stand. The potassium iodide should be powdered, dried and rubbed up with two drachms of starch, with which the mercury salt had been previously mixed, and put in capsules.

Tannic acid 3 i.
 Dispensed in 12 capsules.

in about five minutes; the lanolin was dissolved in about fifteen minutes, but the gelatin becomes insoluble as might be expected.

Potassium acetate 3i.
Make twelve capsules.

While attempting to wipe these capsules off to cleanse them, it was found that they had become very brittle, due no doubt to the absorption of the water in the gelatin by the potassium acetate. There seems nothing to do in this case but to be very careful not to get any of the acetate on the outside of the capsule. The capsule may be worked with alcohol to some advantage.

OINTMENTS.

Salicylic acid gr. xx.
Powdered zinc oxide,
Powdered starch 3ii.
Lard 3i.

This is best prepared by powdering the salicylic acid very finely and rubbing it with the other powders, which should also be very fine. Half of the lard may be *melted* and added to the powders in successive portions. It is not necessary or desirable to replace a portion of the lard with olive oil. A stiff ointment is intended. This is very nearly the formula of "Lassar's Paste," a very popular application with leading dermatologists.

Aristol 3ii.
Quinine sulphate 3i.
Mutton tallow,
Vaselin, of each 3i.

The aristol was dissolved in the melted tallow, by aid of gentle heat, the quinine was rubbed with the vaselin after having been finely powdered, and the two ointments were finally well mixed.

Mercuric iodide gr. vi.
Potassium iodide gr. xxx.
Olive oil 3i.
Lanolin 3i.
Mix, make ointment.

The iodides should be rubbed together and dissolved in smallest possible quantity of water, which solution should be rubbed into the lanolin previously mixed with the olive oil, which is always added to lanolin to overcome its sticky or ropy nature. If separate ointments are made of the iodides, a pinkish ointment will result, yet it is believed the other plan is better.

Extract of belladonna gr. iv.
Cacao butter sufficient.
Make 12 suppositories.

Many difficulties with suppositories may be overcome by using larger moulds and more cacao butter. In this case it would be wise to use the larger size moulds, requiring about sixty grains of the butter for each suppository. With soft or liquid substances like ichthyol and bulky powders it is, generally, only necessary to use larger and permissible quantities of the base to secure results utterly impossible with even thirty-grain suppositories.

This comprehends all the notes of importance sent to the Committee through the envelope system. While they are not very extensive, they offer many helpful and assuring suggestions, and are very encouraging to those interested in the success of the Section.

The contributors to whom much is due are :

C. Osseward, Portland, Ore.

W. R. Neville, Austin, Texas.

G. G. C. Simms, Washington, D. C.

J. F. Llewellyn, Mexico, Mo.

Miss Wanous, Minneapolis, Minn.

Harry Matusow, Philadelphia, Pa.

Wm. F. Kaemmerer, Columbus, Ohio.

T. D. McElhenie Brooklyn, N. Y.

C. S. N. Hallberg, Chicago, Ill.

H. A. B. Dunning, Baltimore, Md.

John Vincent Singer, Baltimore, Md.

Thos. J. Hanrahan, Baltimore, Md.

Frank Black, Baltimore, Md.

And the author.

If fourteen members can do so much work in this line, fourteen hundred would startle the pharmaceutical world.

Mr. Hynson did not attempt to exhaust the subject of contributed notes, and when he stopped to make way for other business he said :

I want to say to this Section that I believe you are more or less interested in this work. This is what has been contributed by fourteen members of this Association, and there is enough here to keep us a week. When we started this Section it was said we couldn't get enough to interest us—that we couldn't get any matter—but these notes show otherwise.

Mr. W. C. Alpers was now given an opportunity to describe an exhibit of prescription and office furniture he was displaying before the Section,

value in the conduct of his business, such as cabinets, counter-closets with sectional shelving for holding fluid preparations, a card-index system for keeping account of stock, prescriptions and accounts with customers, and some handsome window display-cards. Mr. Alpers did not claim credit for originating these devices, but said he had found them very useful in his business. He received the applause of his audience when he had finished.

HINTS FOR DISPENSING AND PHARMACEUTICAL BOOK-KEEPING.

BY WILLIAM C. ALPERS.

A description of a system of all clerical work necessary in pharmacies seems to be well worth the attention of this Section, and to make it the more effective I have brought small models of all the apparatus that I use in this system. Under the name of clerical work I comprise a full system of book-keeping, prescription filing, physicians' records and stock indices, all of which I will successively explain to you. Part of this work, namely, the prescription filing, I have shown before this Association some years ago. For the sake of completeness I beg leave to mention it again here, especially as I have introduced some improvements since then. Before entering on this subject, permit me to say a few words on window display, which also seems to come under the heading of practical pharmacy.

Like all advertising, a proper window display requires thought, time and labor, and without these the window will be but poorly dressed and work more harm than benefit. As the space in the windows represents a certain amount of rent, and therefore a constant expense, its use should not be given to any one without proper compensation. I never exhibit anybody's goods in my windows unless I am paid for it, either in cash or in a special discount. Nor do I believe that the promiscuous exhibit of a great variety of goods is advisable; the passer-by glances over such an exhibition in a dazed, uncertain way, there is no central point of attraction, and before he can fix his eye on any particular object, he has passed the store without retaining any recollection of it. The display should therefore represent but one thing, or one collection of things centered around a uniform idea. A very effectual exhibit can be made by displaying all the pharmaceutical uses of one plant, for instance, cinchona. If possible, have a cinchona plant in the centre, or a picture and preserved parts of it. Put up a percolator, making Tr. Cinchonæ Co., have jars with the various barks, complete, unbroken and powdered, show the alkaloids, the extract, the pills and capsules of various sizes, and put in the background a picture of a cinchona farm. Each article should be neatly labeled. If it is your custom to issue monthly pamphlets to your customers, tell them about cinchona in a popular way, at the time when the exhibit is shown. Besides these somewhat scientific but popular exhibits, your windows should

that you can conscientiously recommend and of whose pharmaceutical elegance you have a right to be proud. Always accompany such an exhibit with a sign, not a carelessly scratched card, but a sign of neatness and elegance, devised and written for the purpose. I always put these signs in a frame, made in easel form with a movable back, so that a change of signs can easily be made. (A frame and sign were exhibited by the writer.) It is true exhibits of this kind require some thought, labor and expense; but it is well worth while to spend all this, the returns fully justify the outlay.

Coming now to the clerical work of the pharmacy, I will say that after trying a number of various systems I have come to the conclusion that the card system is best adapted for pharmaceutical work, and I have therefore adopted it in all its details. Let us take the filing of prescriptions first. Cards of convenient size, 8x6½ inches, are kept ready, each numbered three times with the same number, one for filing, one on perforated flange at the bottom for the customer, as a check, and one for the identification of the package. For the details of these prescription files I refer the reader to our Proceedings for 1897, p. 237, etc. The new feature that I have since introduced consists in one renewal card for all prescriptions of the day, instead of a separate one for each prescription. It is arranged as follows:

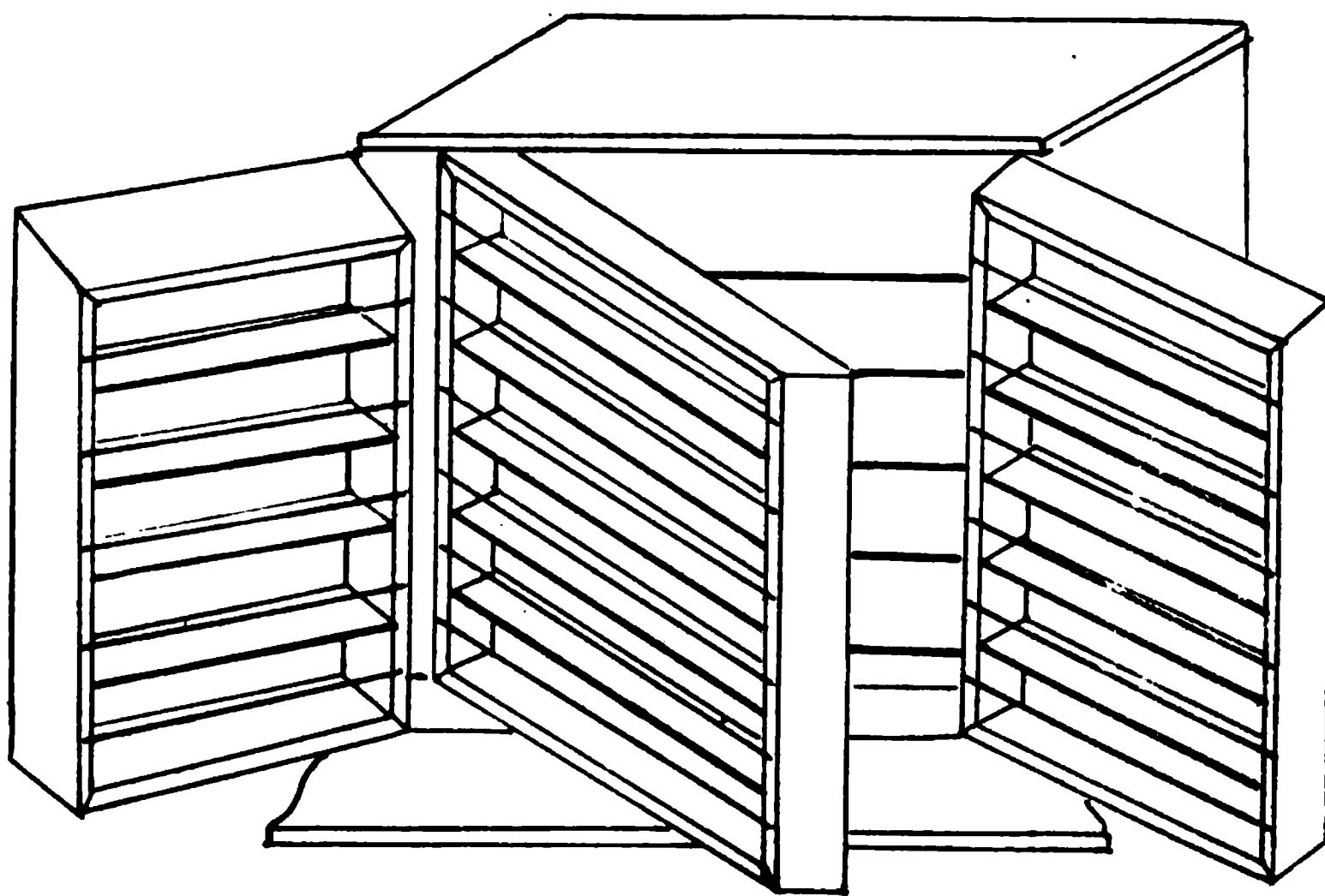
47319.		MARCH 12, 1902.		Renewals.	
Number.	Doctor.	Customer.	Prepared by.	Checked by.	Price.
12371.....	Brown.	Smith.	W. C. A.	Trz.	\$0.75
36897.....	Thelm.	Jones.	R. S.	W. C. A.	60
47220.....	Balline.	Mrs. J. May.	Trz.	R. S.	50
47253.....	Brown.	Ward.	Trz.	W. C. A.	40
45198.....	Towns.	Bell.	Trz.	R. S.	60
47258.....	Balline.	May.	W. C. A.	R. S.	75

The number of this card is not stamped, but is written in the left upper corner, and is always the first number of the day. The card remains on the desk during the day, and is filed with the other cards at night, while the card with the same number is removed. The various headings explain themselves. On the back of each card whose prescription is renewed, the number of the renewal card is written. This renewal card is an advantage over the former system, as from 10 to 20 cards are thus saved a day, and the renewals kept separate from the new prescriptions.

Let me now show you two neat little devices that tend to promote order and give the store a neat appearance. The shelves for the stock bottles, tinctures and salts, etc., are generally broader than the diameter of the

bottles, and unless great care is exercised the bottles are apt to stand in a somewhat irregular line. By putting a second board on the shelves, as far back from the front as the diameter of the bottles that stand before it, all bottles will always stand in a perfectly straight line ; for it is only necessary to shove them close up to this second board. This board also serves another purpose : a second row of bottles may be placed on it, containing either extra stock or articles that are but rarely used. This little device adds greatly to the neat appearance of the store.

The proper arrangement of a great number of bottles containing tablets and pills of various manufacturers, so that each one can quickly be found, is a difficult problem in many pharmacies. This is my solution of the problem : Provide the inner side of the door of the pill-closet with small shelves, wide enough to hold a bottle of 500 pills, and fasten an iron or wooden strip about one inch above each shelf, running across the door, so that the bottles cannot fall off the shelves on opening or closing the door.



In the closet, at a proper distance from the door, put another set of swinging doors, made of plain boards provided on both sides with similar shelves and bars : behind these put another set, and continue this as far as the depth of the closet will allow. Each set of doors must be hinged to upright studs projecting a few inches over the corresponding parts of the doors, in front of them, so as to allow the doors to swing open as far as a right angle. In this way hundreds of pill bottles can be put into one closet, and the face of each can be read with the greatest ease. No dust can get near the labels and the stock can be overlooked at an instant. (A small model of such a pill cabinet was exhibited.)

Stepping now from the dispensing counter into the office, I beg to offer

a number of practical devices for the clerical work necessary in each pharmacy. Let us first speak of the stock cards. One of the greatest mistakes that the average pharmacist makes, is his inability to control his stock, that is, to be able at a minute's notice to give a full account of the purchase, price, sale and disposal of each article in his store. And yet nothing seems to be of greater importance than the careful and continuous watch over the price of each article. I solve this problem in the following manner. A stock card is kept for each article in the store—I have now over 8,000—size 8x6½ inches, arranged as follows :

ACID, CITRIC.

Date.	Quantity.	From.	List Price.	Discount.	Net.	Retail.	Inventory.	Remarks.
June 29, 1901.....	5 lb.	R & S.	1 lb. \$0 46	.....	\$0 42	oz. \$0 10		
August 7, 1901	5 lb.	R & S.	1 lb. 46	.....	39			
October 12, 1901.....	10 lb.	R & S.	1 lb. 46	.....	37			
December 10, 1901....	10 lb.	R & S.	1 lb. 46	.....	36			
December 31, 1901....	.....	.....	.....	.....	.....	.....	3 lb. \$1 08	
February 17, 1902	10 lb.	R & S.	1 lb. \$0 40	.....	\$0 35			

The different headings and entries explain themselves. Whenever an invoice is presented, the junior clerk, who generally does the unpacking in company with the porter, checks off each article, confirming simply the correct delivery. The invoice then passes to the stock cabinet. In small stores, the proprietor, particularly if he is a beginner, should now make the entries ; in larger stores, where a strict subdivision of labor is necessary, the cashier may attend to this work. The card for each item on the invoice is taken from the cabinet and the proper entry made, first the date, the amount of the purchase, the house from whom it is bought, and the price with discount, are entered. The retail price is generally the same. The last two columns, "inventory," are filled out at certain periods, once in six or twelve months. If this work is done systematically, it is very easy to take a correct inventory. But the card serves many other purposes. Whenever an advance of price is made, it is discovered at once, and a note can be sent to the jobber. If goods have been found to have spoiled in an unduly short time, the cards tell where and when they were bought. If complaints are made about the quality of goods, the card shows us where to find redress. A pharmacist who carries on this work systematically will always get "bottom prices" and best quality. He will impress his wholesaler with his system and order to such a degree that he will be treated with the greatest consideration, and his complaints, backed up by dates and facts, will be heeded. As to the time necessary for this work, I must say that this is generally overrated. It is true, a considerable amount of work and time is required to begin these stock cards ; but when once completed, they will not require more than 15 or 20 minutes a

day, even in large stores, to keep them in order. I have these cards arranged in a cabinet of eight drawers, five of which are taken up by them, but ordinary stock drawers could easily be arranged for them. The benefit derived from them, particularly for beginners, cannot be over-estimated.

In the same cabinet I also have a set of "Doctor's Cards." The name of each doctor for whom a prescription is received, is entered on a card, and a record kept of the prescriptions.

JONES, J. C., 176 W. 49th St. 9-12; 2-4.

Number.	Date.	Price.	Number.	Date.	Price.	Number.	Date.	Price.
37635	7/1/01.	75						
37636	"	40						
37637	"	50						
37671	7/2/01.	\$1 00						
37695	"	60						
37743	7/3/01.	60						
37744	"	50						

In small towns where the number of physicians is limited, such a record seems unnecessary. Not so in large cities. I have the names of more than 1000 physicians on cards and know at a glance how many prescriptions I have received from each one. I can therefore arrange my advertising efforts accordingly. But the cards serve another useful purpose. It happens often that customers wish an old prescription to be renewed; they know neither number nor date, but they always remember the doctor's name. Instead of instituting an almost hopeless hunt for the lost prescription, I at once take the doctor's card and thereby reduce the number of prescriptions to be examined to a small figure. With the aid of these cards I have always, without one exception, been able to find an old prescription.

The last set of cards that I wish to show are the "Debtor's Cards."

SMITH, S. N., 416 Fifth Ave.

1901.				
Sept. 2.	Pres. 35176.....	\$0 50		
	Medicine glass	25		
" 3.	Mustard plasters	25		
	Quinine pills, 2 grs.	15		
" 4.	Pres. 35261	75		
	Pres. 35262	1 25		
	Rubber water bottle	2 00		
" 6.	Pres. 35332	75		
	Pres. 35176 (renewed)	50		
" 20.	Castile soap.....	20		
	Atomizer	1 25		
		\$7 85		
Oct. 4.	By check		\$7 85	

They almost explain themselves. Every evening (or next morning) the

slips of the day are entered on these cards. As will be seen, there is a double column for figures, the first one for debits and the second for credits. These latter are entered with red ink. The cards are arranged in alphabetical order and occupy another drawer in my cabinet. This system is far preferable to the old book-ledger. When a customer wishes to see his account, it is only necessary to show him his card. If the account is moving lively, a second or third card can easily be put behind the first one. In a pharmacy of average size it is sufficient to start new cards once a year, while in stores where a great deal of credit business is done, new ones may be started once in six months.

Of all the various sets of cards that I have shown here, I consider the stock cards the most valuable for the commercial success of the pharmacist. It enables him to watch the purchasing price of his goods, which at the present time of keen competition is fully as important as the selling price. For the professional side of pharmacy I claim my card system for prescriptions to be superior to any other system. It enables us to tell the minute, hour and day when a prescription was presented, and when it was finished. It tells the name of the clerk who prepared it, and who checked it, gives the name of the customer, and shows what excipient capsules, mass, etc., has been used ; it counts the number of renewals, the hour and date of each renewal, and again tells the name of the dispenser—in fact, it records every detail from the minute that the prescription comes into the hand of the pharmacist. No question can be asked about a prescription that this card will not answer.

Mr. W. S. Reed, of E. B. Reed & Son, Baltimore, was invited to show and explain a prescription-file he had brought to the meeting, consisting of a cabinet with drawers conveniently indexed, and a mechanical device for arranging and filing prescriptions and keeping them in order. This the gentleman did.

MR. HYNSON: I might say in regard to that file, which I asked Mr. Reed to bring with him here, that you can build them up like the bookcases that you add to in sections. We used books for a long time, until we could hardly find room for them.

Mr. Geo. W. Parisen, of New Jersey, and the Chairman both testified to their satisfactory use of this system, and Mr. Parisen gave some detail of the methods prevailing in his store as to the care of prescriptions.

Mr. Mittelbach, of Missouri, then read the following paper on laboratory record, and was applauded on it :

LABORATORY RECORD.

BY WM. MITTELBACH, BOONVILLE, MO.

For years it has been the practice in my store to keep an accurate record of all preparations made. My apprentice is given to understand that laboratory work is the most important feature of the business, and

with the manufacture or compounding of the simple preparations, and close observations in all details are insisted upon. Accuracy in volume, clearness in appearance, and uniformity in color are features kept in constant view, so that when a preparation is finished it is a pleasure for us all to handle and dispense it. I have the young man make a complete record of his work, by entering in a book kept for the purpose the date when made, the quantity, the name in unabbreviated Latin, and the cost, for instance :

Date.*	Quantity.	Name.	Cost.
	1000 Cc.....	Tinctura Opii Camphorata.	\$0 48
	100 Cc.....	Spiritus Chloroformi.....	10
	500 Gm.....	Syrupus Ferri Iodidi.....	35

* The date at beginning of each line.

PROPRIETARY PREPARATIONS.—RECORD.

Date.	Quantity.	Name.	Cost.	Size of Packages.	Cost per Package.
1902, July 31 ..	1200 Cc....	Electric Liniment .	\$0 60		
1902, July 31 ..	30 Bottles..	Electric Liniment .		3-oz. Ovals.	\$0 07
1902, July 31 ..	10 Boxes ..	Headache Powders.		12	02

By writing the name of a galenical preparation in full, the young man gets good practice in familiarizing himself with the official title, in spelling and in Latin grammar. It is splendid practice, and will soon make itself evident. It is of great benefit to him when he comes up for examination before a board of pharmacy or in college. The value of the careful computation of the cost of an article is apparent to all. You will notice that the record of the proprietary preparations is kept separate from that of the tinctures, elixirs, ointments, &c., but on the same principle. I thus have a complete and very interesting record of my laboratory work, and a splendid guide for the future.

THE CHAIRMAN: Gentlemen, it is obligatory upon this session to elect officers of this Section, and I believe it will be satisfactory if some gentleman will move the election of the gentlemen named this morning—Mr. Geo. M. Beringer, of Camden, N. J., for Chairman; Mr. W. H. Burke, of Detroit, Mich., for Secretary, and Mr. H. A. B. Dunning, of Baltimore, for Associate Member of the Committee.

Mr. Mayo moved that the Secretary of the Section cast the affirmative ballot of the Section electing these gentlemen to the offices designated. This motion prevailed, and the Secretary announced that he had cast the vote as directed. The chair thereupon declared these gentlemen duly elected.

At request of the chair, Mr. Beringer came forward to be installed in office.

THE CHAIRMAN: Gentlemen, I have the pleasure to introduce to you Mr. Geo. M. Beringer, your Chairman for the coming year. [Applause.]

MR. HYNSON: I want to say I congratulate the Section on the election of Mr. Beringer. I have been associated with him this year, and there was a good deal of work to do, and he did it all.

MR. BERINGER: Mr. Chairman and Members of the Section: This position has been thrust upon me. I did not feel that I could give the time to this work. However, I accept it as a matter of duty, though I did not desire it, and shall ask the co-operation of the members. If I weary you and worry you when I ask you to go to work, forgive me; it is your fault and not mine. It is too late to make a speech at this hour. I will merely thank you for the honor conferred upon me, and say to you that I will endeavor to do my duty during the coming year.

Mr. Beringer took the chair.

The chair called for Mr. Dunning.

Mr. Dunning then came forward and the Chairman introduced him to the Section.

MR. DUNNING: Gentlemen, I am sure you will excuse me from making a speech, because I have no experience in that line. About all I can say is, that I thank you for this election. I am new to this line of work, and also to the Association, this being my first visit. I hope to do some good work, however. [Applause.]

Mr. Burke, the new Secretary, was called for by the chair, and when he came forward the Chairman congratulated him upon his selection for this office and introduced him to the Section.

MR. BURKE: A great many people have the idea that an officer of a Section should do all the work—or most of it. My conception of that is different: I think the officers are here to see that somebody else does the work. [Laughter.] I believe it is better to talk about what you have done than to talk about what you are going to do; consequently, I will postpone the rest of this speech until next year. [Applause.]

MR. HYNSON: I want to say to the gentlemen who have just been installed that all we want in this Section is more time; and we don't want to be interfered with by a steamboat excursion at both ends, either. You will have plenty to do, if you can find the time to do it in.

THE CHAIRMAN: It has been suggested that the remaining papers on the program be read by title only and referred for publication.

Mr. Hynson made the motion and it was so ordered.

The Secretary then read by title the following papers :

Some Observations on Syrup of Iodide of Iron, by Wm. F. Kaemmerer.

Device for Spotted Plasters, by F. W. Schueller.

The Pharmacy of Fifty Years Ago, by C. V. Emich.

The Past and Present of Pharmacy, by Chas. T. P. Fennel.

A Home-Made Inhaler, by Wm. F. Kaemmerer.

Pharmaceutical Notes, by Thos. D. McElhenie.

The Comparative Value of Purified Talcum and Calcium Phosphate as Clarifying and Distributing Agents, by Wm. F. Kaemmerer.

The Secretary stated that the balance of the unfinished program consisted of displays it was intended to have ; that it was intended to display a lot of prescriptions that had been brought during the past fifty years into Mr. Fennel's store in Cincinnati—prescriptions so arranged on charts as to show the changes that have taken place in medication.

The chair stated that the prescriptions of Mr. Fennel would be exhibited in Horticultural Hall across the way for a day or two longer, to give the members full opportunity to examine them.

Thereupon Mr. Caswell A. Mayo moved that the Section should now adjourn, and the motion was put and carried.

The following is the full text of the papers read by title :

SOME OBSERVATIONS ON SYRUP OF IODIDE OF IRON.

BY WM. F. KAEMMERER.

Having my attention called to the use of citric acid in preventing change in syrup of iodide of iron, I gave it a trial and was led to believe that it solved the problem. Further observations were disappointing. Half a per cent. of citric acid, while greatly retarding any change, did not prevent the change. The change took place very slowly at first, but after quite some time the syrup became just as brown as if no citric acid had been added, and when tested with starch test solution gave abundant reaction for free iodine. Subsequent trials with one per cent. of citric acid, and 25 per cent. of glucose, and with one per cent. of citric acid plus 25 per cent. of glucose, respectively, the final results were the same, and although the change in each case was somewhat longer retarded, it was not prevented. No change was noticeable where the directions of the Pharmacopœia were carried out, of keeping the syrup in small, well stoppered and completely filled bottles. Syrup of iodide of iron that has become dark, if exposed to direct sunlight, will return almost to its natural color again. I say almost, because while the syrup did not show any brownish tint, nor give any reaction for free iodine, it did not have the same green color, but was somewhat lighter. Samples that had been allowed to change several times, that is (they had been allowed to become dark, then exposed to sunlight again), after each exposure to sunlight, became lighter in color until finally they became almost colorless. It is a

patient, and on questioning the physician was told that it had been very satisfactory.

DEVICE FOR SPOTTED PLASTERS.

BY F. W. SCHUELLER, COLUMBUS, O.

The following is a handy device for marking the spots on adhesive plaster for making a spotted plaster :

A spotted plaster is made by making spots of cantharidal collodion about three-eighths of an inch in diameter about an inch apart and arranged in a square on adhesive plaster. Ordinarily when a spotted plaster is called for the usual method is to use a foot rule for measuring off the spaces and to mark the spots with a pencil where the cantharidal collodion is to be placed. This takes time, and unless one be careful the plaster will not be square, nor the spots be evenly spaced. Where these plasters are frequently called for it will be found an advantage to have prepared beforehand a piece of smooth cardboard with small holes punched through it an inch apart and arranged in a square. The cardboard should be as large as any plaster likely to be called for. When a plaster is to be made the perforated card is placed over the adhesive side of the plaster and markings made with a pointed pencil through the holes enclosed by the space as large as the plaster is to be, being careful not to perforate the plaster. The card is then removed, the plaster tacked down on a board, and each spot is touched with a small glass tube after having been first dipped into cantharidal collodion.

Rubber adhesive plaster should never be used for making spotted plaster, because of the difficulty which it will cause in its removal. The manufacturers now make a plaster which is exactly suited for the purpose. It is a plaster very much like the old style Taylor's adhesive plaster.

THE PHARMACY OF FIFTY YEARS AGO.

BY C. V. EMICH, BALTIMORE, MD.

The practice of pharmacy as it was fifty years ago was not to be decried ; though thought by many to be far behind the present development. Let it be understood "there were giants in those days" in the profession as well as in previous periods, and records have been left that have aided and assisted the present development.

Such men as Mr. Wm. Procter, Edward Parrish, George Wansey Andrews, Israel Grahame, John Milhau, Samuel Simes, John Meakin, and many others, being dead, yet speak.

The writer entered the business as an apprentice in February, 1848, and is still pegging away ; sometimes tempted to complain at the changes, and then is compelled to remember the words of the Wise man, "There is nothing new under the sun ; what is has been and what is to be is now."

self at all about it. Wood and Bache's Dispensatory, Faraday's Chemical Manipulations, and later Campbell Morfit's work, were the principal ones to be found. One work also was published in Philadelphia about this time.

Mohr and Redwood's Pharmacy, edited and revised by Mr. Wm. Procter.

This book was a revelation to the writer, nor has he yet forgotten the value of Turner's chemistry in the multitude of compounds described, which has often stood him in good stead during his trials and tribulations in the business.

The process of Displacement, then called, now Percolation, introduced in 1833, the same month of the birth of the writer, which lay dormant, about 1850 began to grow and develop.

Mr. Procter with his various formulas for extracts, aided by the intelligent work of Mr. Grahame and others, stimulated and forced it into more general use, and its development by Dr. Squibb and a host of other workers made it the standard for pharmaceutical work. Yet strange to state, Dr. Squibb's famous well percolator is almost in its general design a fac-simile of one that was made in 1840 and probably illustrated in Mohr and Redwood's Pharmacy. No longer having the works at hand, the writer cannot now verify his statement. In the compounding of formulas many changes have taken place, *e. g.*, liquor ferri iodidi. In those days purified honey was the preservative used; its preparation was a formidable task. The honey was first dissolved in alcohol, then saturated with creta ppt. and filtered and evaporated to a syrupy consistence. The iron and iodine combined as now and filtered into honey. It is almost needless to say that this purified honey became a favorite tippie with many a youngster in the business. Co. Tr. Cardamom in those days had seeded raisins and honey among the ingredients.

Dr. Squibb after his entrance or rather previous to his entrance into manufacturing, did much to improve the quality of many of the chemicals and remedies in the business, and yet in the beginning of his career must have been indebted to the old Edinburgh Pharmacopœia.

The writer well remembers the efforts to inaugurate the American Pharmaceutical Association by Messrs. Andrews, Grahame and others, and the difficulty of arousing interest in the effort, and it was not until the meeting in 1856 that much interest in Baltimore was aroused.

The type of prescriptions during the past fifty years has undergone great changes. In those days the doctor was capable of doing his own compounding, and generally had students in his office that did at least a portion of it.

The variety of prescriptions was not great, but work was generally involved in their compounding. One doctor of Baltimore was very fond of a combination of charcoal and magnesia in liberal doses, viz :

R. Carbon. Ligni Pulv.....	3 iv.
Magnesiae Carbonatis	3 iv.
M. ft. in Pulv. xxiv.	

Sometimes doubling quantities and making fifty powders—occasionally ordering 1 grain of potassium cyanide to be mixed with the other articles before dividing.

In 1849 we had a slight outbreak of cholera in Baltimore, followed in 1850 by a great deal of bowel trouble. The great remedy in 1850 for this bowel trouble was small doses of calomel, 6 or 8 grs. of calomel with same of sugar in 6 to 8 powders. It was regarded as the specific and the patient got well. In 1851 the same trouble prevailed and the remedy that was so efficient in 1850 produced death, unless the doctor was very careful.

It was in the early fifties that the writer was called upon to prepare two prescriptions that appalled him, viz :

R. Sol. Morphin Magandie..... gtt. 200.
 Chloroformi..... gtt. 180.
 Aquæ q. s. ft..... ʒ ii.
 S.—Teaspoonful every hour or two.

It was compounded and did its work, and the patient recovered from an attack of mania à potu.

The other was :

R. Ext. belladonnæ... ʒ i.
 Aquæ..... ʒ ii.
 Mix. S.—Ten drops every two hours.

The writer asked the gentleman who handed him the prescription what the doctor said. The reply was : "The doctor said if it does not relieve the child it will die ;" and the prescription was filled, and the child is now a grandmother in Israel. Doctors were prompt and bold in their use of remedies in those days, and with a difference of remedies meet the issue to-day.

The writer has had much experience in heavy dosing, beginning with his younger years in the business ; the heaviest probably being a prescription containing $\frac{1}{2}$ gr. of sulphate of strychnine taken three times daily.

The improvement in educational facilities has undoubtedly caused many changes between the past and the present, but they are in degree more than in kind.

The development of the manufacturing pharmacist is fairly to be classed as a great if not principal factor in the changes that have taken place, and the young men of the present too readily give way and suffer the result of seeing the field monopolized by the manufacturer, a result to be deplored, as the young men enter the field of commercial strife much better equipped than were those of the past.

Great as has been the stride in the past 20 years, the field is open wide for all that have the energy and ambition to enter in and possess the land.

The present generation can hardly appreciate the situation between past and present. Fifty years ago, Cincinnati was considered the center of civilization; in fact, it was the center of education and with it culture and refinement reigned supreme. At the present time, this period fails to impress the majority with its importance. We all fail to recognize the difficulties that had to be overcome both in medicine and pharmacy. We can hardly appreciate that the opportunities for the interchange of thought were so limited. The advances made have been so marvelous and in so short a period of time that we are very apt to forget the individual efforts made at that period. The early history shows that medicine and pharmacy were in the hands of the English, largely based upon knowledge obtained from the Indians. This is true as late as 1840-1850. The political agitations in Germany in 1848, and attracted by the republican form of our government, brought the very best element to Cincinnati. Both medicine and pharmacy were in the hands of the Germans and naturally partook of German characteristics. Both German and English were particularly fond of mercury and its combinations, ipecac, etc., as shown by the prescriptions written between 1850-1860. You will notice that both nationalities were much influenced by a code of ethics, avoiding every opportunity of advertising through prescription blanks.

In looking over our files, covering a period of over fifty years, of more than 1,000,000 prescriptions, I can find in the period (1850-60) only one case of specialization, and this one occurs quite frequently, viz., Husband's Calcined Magnesia. The next period (1860-1870) shows but little change excepting that infusions and decoctions find greater favor. The period was not conducive to intellectual progress, and when we take the times into consideration we must express surprise that both medicine and pharmacy were kept in touch with the progress made in foreign countries.

The next period (1870-80) is in my estimation the true period of American pharmacy. The files show greater diversity in preparations of strictly pharmaceutical nature. Specialization became more general, but the products were true to name and composition. The advent of the manufacturer is shown in gelatin-coated pills, etc.

The next period (1880-90) shows the synthetic period, mostly products of foreign thought and ingenuity, mainly of German parentage. The period is properly a chemical period and finds no place in pharmaceutical history. The majority of these preparations are not true to name and are probably not true to composition.

The next period (1890-1900) the American manufacturer, stimulated

* This paper was accompanied by a carefully prepared set of charts, representing prescriptions of five decades.

ingenuity and produced a series of products of which but few are true to name and composition. Like the preceding period it finds no place in pharmaceutic history. The selection of prescriptions in charts of the last two periods has been without prejudice, and is a fair representation of the status of medicine and her subservient maid "pharmacy." Superficially considered one might believe that pharmacy had degenerated in the last two periods, but more careful study will show that all prescriptions of legitimate pharmacy aim at a higher standard than those of the period of 1870-80, all demanding specific strength and purity. True pharmacy has kept in touch with progress, and I regret that I cannot have the pleasure of calling attention to every prescription, for they recall to my memory the making and introduction of pharmaceutic products.

I distinctly recall the making of chloroform, the difficulties to contend with owing to the lack of the facilities of to-day. Ethyl iodide gave me much worry and trouble, all on account of the want of the separatory funnel of to-day. Operations that are simple to-day, taxed your ingenuity and patience. Citrine ointment made with cod-liver oil was produced in the early 60's upon the formula furnished by the celebrated oculist, Dr. Williams, direct from Paris. Likewise the yellow oxide of mercury in impalpable powder. A little later the preparation of the solution of bromide of arsenic and potassa upon request of Dr. Comegys. How well I recollect the formulæ used by Prof. Diehl for elixirs—gallons of each were my lot, filled into bottles, full and half full, exposed to all kinds of influences, heat, air, light, etc. Iodide of iron and Vallet's mass in pill form coated with various masses—even gelatin was tried but found wanting, because I lacked the dexterity in closing the holes made by darning needles. Blanchard's pills gave rise to all this experience to satisfy Dr. Holdt, who was very fond of this make. Glycerite of starch was made as early as 1868, and many a thermometer was broken, since the latter also acted in the capacity of a stirring rod: again a lack of dexterity in handling a stirring rod and thermometer at one time. I might go on, but I shall leave the charts sent to your good judgment, and trust they may prove of service.

A HOME-MADE INHALER.

BY WILLIAM F. KAEMMERER.

Take a wide-mouthed, three or four ounce bottle, fitted with a doubly perforated cork; through one of the perforations insert a straight piece of glass tubing of about a quarter inch diameter, one end of which should reach nearly to the bottom of the bottle and the other to extend about a half inch above the cork; through the other perforation insert another piece of glass tubing the same size and length as the other, but bent near its center at an angle of about forty-five degrees. The short end of the

nose-piece for the inhaler, use a No. 4 or 5 good prescription cork perforated so as to fit over the long end of the bent tube. In order to give the inhaler a finished appearance, the cork parts are to be painted with black enamel paint. When the inhaler is to be used for inhalation by mouth, the nose piece is to be removed.

Following is the formula of inhalant to be used in the inhaler :

Tincture of tolu, two fluid ounces ; tincture of benzoin, one fluid ounce ; camphor, three drachms ; menthol, one and a half drachms ; creosote, oil of bitter almonds, of each, a half fluid drachm ; chloroform, two fluid drachms ; alcohol, a sufficient quantity to make eight fluid ounces. Dissolve the camphor and menthol in the tincture of tolu and add the other ingredients.

The directions for use are : To fill the inhaler about half full of the inhalant and inhale for two or three minutes four or five times a day, or oftener if necessary.

The above has been found valuable for the relief of cold in the head, catarrh and asthma.

PHARMACEUTICAL NOTES.

BY THOS. D. M'ELHENIE, BROOKLYN, N. Y.

SYRUP OF TOLU.

A new generation of pharmacists in many classes from the colleges has arisen since I told before the Kings County Pharmaceutical Society of the short cut to syrup of tolu as follows :

Take of

Double strength tincture of tolu..... 8 oza.

Precipitated chalk 6 oza.

Boiling water 7½ pta.

Put into a jug. Shake and filter into another jug containing

Sugar (granulated) 14 lbs.

Dissolve and strain. This saves time.

SYRUP OF GARLIC.

Syrup of garlic is usually slighted by the pharmacist who is repulsed by the odor before allowing himself a chance to be attracted by the taste. It has a pleasant acetous taste, and when dispensed with an equal measure of syrup of tolu it makes a very good expectorant. My family physician has ordered it in that way for years and says the children cry for it. Having had some practice in making it I don't mind telling how to do it, at the same time working in some suggestions on home-made apparatus. Operating as I did recently on a 2000 Cc. quantity, I took 400 grams of garlic and chopped it with a hash knife in a wooden chopping bowl, and just here the metallic circuit breaks. Nothing of metal came in contact

with the material or product further. The minced garlic was put into an old style ringed candy jar fished out of the cellar, the dilute acid (1000 Cc.) poured on, and the jar allowed to stand three or four days. In the meantime a Gibson tablet bottle was turned into a percolator by cracking off the bottom and covering the mouth with a couple of disks of filter paper and cheese cloth. This percolator rigged over another candy jar marked for 2000 Cc. and containing the sugar 1600 Gms. completed the outfit. The syrup was finally filtered through paper and filled into Apollinaris pint bottles, labeled and laid on the side in the cellar, in the same bin with all the utensils, which are plainly marked and will be kept for that purpose. The finished syrup is as handsome as syrup of tolu, having a slight greenish tint. Almost every bulb of garlic has a green center, a partially matured clove, which gives the color. I had a little of the syrup from a wholesale house about that time and it was the color of the fluid extract licorice. I am constrained to admit that I returned it and later presented them a sample of the syrup made as described.

POWDER FOLDER.

The best one I know of is the one I invented and had made eighteen or twenty years ago. It has been in steady use ever since and is still satisfactory. A strip of walnut about an inch thick, beveled on both edges, leaving the upper edge as wide as the desired length of powders. This runs in two others, each beveled one way, screwed under counter. The folder is always handy and never in the way.

BLAUD'S PILLS.

Not the strictly official but the commonly accepted form, namely, equal parts of dried potassium carbonate and dried sulphate of iron. A good trick in the making of pills hard is to rub down the carbonate and any other ingredients to a soft mass with syrup, then drop in the iron salt finely powdered in a separate dry mortar. A little working yields a nice mass of light green color containing nascent carbonate of iron.

THE COMPARATIVE VALUE OF PURIFIED TALCUM AND CALCIUM PHOSPHATE AS CLARIFYING AND DISTRIBUTING AGENTS.

BY WM. F. KAEMMERER.

When the Pharmacopœia of 1890 appeared, directing phosphate of calcium in the preparation of aromatic waters, we, of course, gave it a trial at the first opportunity. Unfortunately the phosphate of calcium we used was not a pure article, and our first trial with it did not prove satisfactory; we therefore abandoned it and turned our attention to washed talcum (see Proc., 1901, p. 138), which we thought was better for the purpose, and have continued to use it in the place of phosphate of calcium until quite recently.

experienced in trying to filter the mixtures of fluid extract of ginger and water, and the solution of tolu and water; filtration in both instances proceeding very slowly, coming through very cloudy, and necessitating a repeated return of the filtrate to the filter.

Washed talcum has never given us any trouble except in these two instances, although we used it in preparing nearly all of the official preparations and several unofficial ones requiring a clarifying or a distributing agent.

In preparing washed talcum, it occurred to us that we might just as well treat the talcum with hydrochloric acid as directed in the National Formulary under purified talcum, which latter course was subsequently carried out and the product used with equally good results, so that it was thought that the talcum thus prepared was superior to phosphate of calcium.

In order to settle the matter we began to experiment. Two sets of preparations were made including both official and unofficial preparations, and under like conditions, excepting that in the one case, phosphate of calcium was used, and in the other purified talcum was used. In order to be fair we were careful to obtain a reliable phosphate of calcium, and it was found that in every instance phosphate of calcium proved to be better for the purpose than purified talcum.

With the aromatic waters, purified talcum did not yield quite as clear a preparation as when phosphate of calcium was used, a slight milkiness being observable even after repeatedly returning them to the filter. Syrup of ginger and syrup of tolu as noted before gave considerable trouble when purified talcum was used, and in the case of tincture of opium no difference was observable as far as manipulation was concerned.

In the course of these experiments certain observations were made, which, while they are not new, it is well to direct attention to them.

1. Syrup of tolu and syrup of ginger when prepared strictly according to the present Pharmacopœia, are both very unstable preparations.

If a strong bottle three-fourths filled with either syrup of tolu or syrup of ginger, be tightly closed with a cork and left standing for a week or two at ordinary temperature, the cork on being loosened will be forced out with some pressure, bubbles will make their appearance throughout the syrup and rise rapidly to the surface, showing considerable change to have taken place. The odor also will be found to be anything but agreeable. Syrup of tolu even when kept under the most favorable conditions will, with age, acquire a disagreeable odor, resembling somewhat the odor of benzoin.

This will not occur if these two syrups are made according to the Pharmacopœia of 1870, or if the alcohol in the present process for these syrups be suffered to remain in the preparation instead of allowing it to evaporate.

2. For preparations that are to be colorless or nearly so, only white filter paper should be used. Much time can be saved by using a properly folded filter. A properly folded filter should resemble a fan with 32 exactly equal parts, with the edges perfectly even when laid together, and narrowing down to as small a point as possible without breaking the paper.

3. The Pharmacopœia directs under tincture of opium that after adding the alcohol, mix thoroughly and transfer the whole to a cylindrical percolator. Right here it is very necessary to observe the directions of the Pharmacopœia as given under the head of percolation, especially where it reads: "The percolator is prepared for percolation by gently pressing a small tuft of cotton in the neck above the cork, a thin layer of clean and dry sand being then poured upon the surface of the cotton to hold it in place." Unless a layer of clean and dry sand is poured upon the surface of the cotton, percolation will proceed very slowly and in a short time stop altogether. It is best to use about a half-inch layer of sand; the kind known as bird gravel will be found to answer the purpose very well. It may be of some interest here to note that the use of cotton and sand in connection with the percolation of tincture of opium was recommended by Prof. John M. Maisch in a paper read before this Association in 1858, just forty-four years ago.

In using granulated opium in preparing tincture of opium it is not necessary to treat the opium first with hot water, nor to add the phosphate of calcium. It is only necessary to pour the granulated opium into the percolator, press it down evenly, using only a slight pressure, cover it with a closely fitting piece of filter paper and on top of this pour a layer of clean and dry sand, pour on diluted alcohol and when the liquid begins to drop from the percolator stop the percolation and allow it to macerate for twelve hours, when the percolation is to be continued until the required quantity is obtained.

Wishing to know positively whether it made any real difference in the tincture of opium when prepared with talcum, I had a sample of powdered opium, a sample of each of the tinctures, one in which purified talcum had been used and one in which phosphate of calcium had been used, and the dregs left in the percolators, submitted to a most careful examination, and received the following report:

* Concerning assays of the opium, tincture of opium and the examination of the dregs from the preparation of the latter will say. Two assays using 10 grammes in each case following the U. S. P. method to complete exhaustion (determined by testing the filtrate for alkaloids with Mayer's reagent, "potassio-mercuric iodide") in the case of the opium.

1. The only variation from the U. S. P. method was the subsequent weighing of the tared Erlenmeyer flask so as to account for adherent crystals of morphine.

2. The use of tared double filters in preference of trying to remove the morphine from the filter.

* Assays were made by Dr. John G. Spenser, of Cleveland, Ohio.

MINUTES

OF THE

SECTION ON EDUCATION AND LEGISLATION.

FIRST SESSION—SATURDAY MORNING, SEPT. 13, 1902.

The first session of the Section on Education and Legislation was called to order by Chairman Eberle in the convention hall of the Hotel Walton at 10 a. m.

Mr. Edward Kremers was called to the chair while the Chairman read his address, which was as follows :

CHAIRMAN'S ADDRESS.

The American Pharmaceutical Association is to be congratulated because of its completion of the first fifty years of its existence. A cycle of time fraught with changes in the political, commercial and professional life that are astounding to any one who lingers in thought upon this remarkable exhibition of activity and rapid progression of events.

No matter what the quality or kind of vocation, it is more or less affected by surrounding conditions, and in ratio to the bearing the events have upon it or are themselves contributory to the events. Scanning the period involved in the fifty years past, we see our country with its population about trebled at the present. From a nation of borrowers, our financiers to-day arrange loans with foreign manufacturers and governments; from a state of seeking supplies and manufactured articles abroad, our manufacturers now export with an increasing volume, that leads foreign nations to contemplate with anxiety the effect of this changed condition upon their people.

The discoveries, inventions, and the perfection and development of the arts and sciences during this period can hardly be mentioned only, with allotment of much more space than the purpose I have in making reference to them will permit, so that without even naming any of them, your mind will survey the array and in astonishment acknowledge a wonderful transmutation.

The pages of history, written by the acts of our country during this same space of time, have changed the geography and caused nations to alter their form of government. During the same period there was a time when it almost seemed as though sectional disagreement would result in a divided country, but instead there arose a monument dedicated by a united people to the memory of its fallen heroes.

The abundant yield of treasures from the earth and the fertile fields are sources that attract the adventurer and the peasant and develop and populate the respective localities. The acquirement by purchase, accession and by settlement of indemnities has extended

our confines to such an extent that the sun continually shines upon some portion of our country's domain, and the citizenship includes people of every race and tongue.

Consider this cosmopolitan citizenship coupled with such decisive changes and developments, and the fact that our calling is perhaps, in its present state, more complex than any other in the whole category of trades and professions, and numbers among its devotees men of almost every grade of intelligence and education, who pursue the vocation for purposes quite as varied, and we will have reasons galore for congratulating the American Pharmaceutical Association, through whose influence largely pharmacy was guided, upon the termination of their first fifty years of most enthusiastic, useful and beneficent labor.

A few brief historical remarks concerning the Association, tracing it by strides and without detail to the present day, and touching the lines of demarcation of this Section at least spasmodically, will, I hope, be excused.

Prior to 1848, the United States received a large share of the unmarketable drugs of Europe; it was then that an enactment of Congress provided for inspectors of drugs and medicines, and it was to arrange for uniformity of the standard for inspection that a call was issued by the New York College of Pharmacy for a convention of delegates from the various colleges of pharmacy. This convention met October 15, 1851, and included representatives from the colleges of Philadelphia, New York and Massachusetts, and was really the nucleus from which emanated the American Pharmaceutical Association. It was decided to issue a call for a convention to meet in Philadelphia the next year and invite all pharmaceutical societies to participate in the deliberations. This convention met October 6, 1852, and perfected organization as the American Pharmaceutical Association. The work of the first few years was largely directed to define the standard for imported drugs; still in that very early day, matters that concern us even now were subjects of discussion. That these enthusiastic disciples were laboring for what we still work for to-day is evidenced by the earlier Proceedings, which inform us that they attempted to have examiners of drugs appointed, who were graduates in pharmacy.

The tendency of self-medication was fully recognized and efforts made to induce State Legislation regulating the sale of medicines, through the influence of State Associations and the aid of the medical profession. Reports were made upon poison regulations; the Metric System was recommended and advocated; unofficial formulas were presented in 1857, and in the session of the year following, Wm. Procter, Jr., presented the syllabus of a course of study in pharmacy, which is the basis of that taught in the schools to-day. So within the first six years of the existence of the American Pharmaceutical Association matters that underlie our purposes to-day were promulgated. The tariff and especially the stamp tax received considerable attention in the early sixties. It was not until 1869 that a draft of a pharmacy law came before the Association. Following upon this, considerable attention was devoted to legislation, and cities first, then states, adopted laws regulating the practice of pharmacy. State Associations were formed throughout the country, and in due time succeeded in placing upon the statute books laws regulating the practice of pharmacy, and had it not been that the Governor of Idaho exercised his prerogative, then we could have celebrated this semi-centennial with the satisfaction of knowing that a pharmacy law existed in every state of the Union.

Legislation pertaining to the sale of liquors received and is receiving occasional attention to-day. In 1875, a Conference of Teaching Faculties was formed only to be dissolved soon thereafter, but re-established at the meeting in Richmond. The National Formulary was ordered printed in 1887. In 1888 the Association was incorporated. The most important step taken that concerns legislation at the present was the adoption of a Model Pharmacy Law. A most essential and valuable aid to the Association for facilitating and accomplishing work was developed in the division of its work into Sections.

From the very beginning we can see the purpose of elevating the profession faithfully

adhered to, which requires a watchful care over the laws enacted and a shaping of the curriculums of the schools of pharmacy, so that the welfare of the votaries may be enhanced and guarded. Matters that pertain to the conducting of the drug store were and are continually subjects for consideration and comprise such varied topics that it is impossible to mention them in this connection.

The drug store of 1852 was quite a different establishment from that of to-day. The soda fountain did not occupy the conspicuous place allotted to it in many stores at the present, neither had it a very imposing appearance. The cigar stand was then considered an innovation instead of the important side line it now represents in many drug stores. The shelf tincture bottles were mostly of a large size, and in them the tinctures were frequently made by the then most common method, maceration. The infusion and decoction vessels and plaster irons were then in daily use. Drug mills and the "Iron Mortar" located on a pedestal which extended through to the basement floor, were the more prominent evidences that here crude drugs were converted into the prescribed condition for administration. Powders, infusions, decoctions, mixtures, pills and plasters constituted by far the greater number of the prescriptions. The principal wants of the physicians were few and the druggist prepared practically all the preparations he needed. Patent medicines were not quite as numerous as now, but in their place the old English remedies made by the druggist himself were extensively sold. The stock was quite as varied, but the side lines were other than to-day. The druggist was called upon to vaccinate, draw teeth, bleed, apply leeches and perform minor surgical operations. The apprentice was then what the name implies; he was apprenticed to the proprietor of the store for a certain number of years, and in part consideration thereof, he was instructed in the art. The druggist of the day practiced the art of the apothecary, the science of pharmacy was in a state of development.

In the convention to prepare the Pharmacopoeia of 1850, colleges of pharmacy were for the first time requested to send delegates upon equal terms with medical colleges, for which reason pharmacists were well represented. This was the edition in which fluid extracts, seven in number, first made their appearance; the infusions and decoctions together numbered forty-five.

There were then four colleges of pharmacy, and these were practically night schools for the purpose of instructing clerks and apprentices.

There were three pharmaceutical journals. The *American Journal of Pharmacy* was published quarterly up to and inclusive of 1854, from which time it was published every other month until it was made a monthly publication.

Two years ago the United States attained the rank of being the largest exporters, overstepping Great Britain's mark of last year by something like seventy million dollars. Among these exported goods, articles akin to our profession come in for a reasonable and growing share. Our improved facilities and the letting down of the bars when Dewey sank the Spanish fleet have opened a field for advancement of every class of manufactured products, which will influence our chemical and pharmaceutical industries.

In 1852 the greater share of our drugs and chemicals came from Europe; to-day the proportion has at least been changed: we compete successfully with all countries, except perhaps in the manufacture of articles where alcohol enters into the manipulation. There is under consideration at this time a movement to induce Congress to reduce the tax on alcohol from \$1.10 to 70 cents per proof gallon. In as much as we are materially interested in having cheap alcohol, so that we can compete in the manufacture of products in which the cost of alcohol is an important item, and as it is also used in a very large proportion of the preparations made by the druggist, we should, as an association, go on record as favoring it, and lend our efforts collectively and individually to this end. There is this point to be considered: Will the reduction of the tax compel the retailer to a disadvantageous reduction in price of articles so affected? Again, should even this be

valid grounds for opposition? Should the government maintain a high tariff on drugs for like reason? I believe the saving induced on an article so extensively used is sufficient argument in favor of the reduction.

The proceedings of our Association indicate the prevailing condition of pharmacy. The papers recorded in the earlier proceedings were largely along the line of collecting and preserving drugs, their adulteration and sophistication. Shelf-ware, furniture, graduated measures, etc., come in for a liberal amount of consideration. To-day the subjects have assumed a more scientific nature; we deal little with crude drugs; our minds must be trained to dispense the more complex chemicals correctly and in more elegant form. Formerly the dose measure was not so important as now, for the quantity of medicine given at one time or for a dose was larger fifty years ago, owing to the fact that infusions and decoctions or teas were largely in vogue; we have more concentrated preparations, and the dose measure, which was then accurate enough, may be a source of danger with the potent remedies of to-day, aside from the inaccuracy of dosage. It is, therefore, quite opportune that the public be instructed as to what is meant when they are directed to give the patient a teaspoonful, namely: that a fluid ounce of a prescription directed to be given in teaspoonful doses should represent exactly eight equal doses, and not six or seven.

The manufacturers of bottles and shop furniture have stepped in and relieved us of the necessity of devising; they make this a special study and employ artists in the line to do for us what we could only expect to approximate.

We take up methods of teaching the arts and sciences that go to make up pharmacy; we discuss and endeavor to analyze what forms of specialization will develop and what the necessary qualifications will be, or what system of combination will grow out of the drug stores that exist and are in transition. We study the necessary legal restrictions for the person who desires to follow our calling, and for the prevention of illegitimate sale of narcotic drugs and poisons. Laws that regulate the hours of labor of the clerks and apprentices, and the standard of general education required of the latter, are now frequently interspersed. The making of events by our country forces upon us occasionally such topics as the stamp tax, the best way to bear it and the quickest way to get rid of it, and the liquor tax comes in for its share of consideration. The effort to induce our progressive country to adopt a system of weights and measures in harmony with her perfect money system annually receives consideration, and last, but not by any means least, our laudable efforts to elevate the standing of the pharmacist in the government service, forms a subject each year of much interest to all, and for which we must continue to labor until we receive for them the recognition they are entitled to.

The drug store of to-day has changed with the advancement in pharmacy; it is next to impossible to portray one that would typify all, for as a matter of fact, the drug store simply evidences the man of the mortar and pestle within. The requirements have changed; crude drugs are not now as extensively used, the manufactured article has largely displaced these, the druggist now devotes more attention to the study of those chemicals which have been developed by the skill of those who study this particular field, he makes analyses and microscopical examinations for the physician; in other words, he has progressed in the science of pharmacy. If we look again into another drug store we have more of a commercial aspect, the soda fountain and cigar stand in conspicuous evidence, together with such articles that do not necessitate knowledge of the science, but rather a more acute idea of the best methods of buying and selling.

The fact that many men in the drug business had neither the skill nor inclination to manufacture preparations necessary for their business, led some of the more advanced to enter the field of manufacturing pharmaceuticals for these, and so it is that to-day we have the large manufacturing houses, who by close and studious attention absorb a large portion of the work which fell to the lot of the druggist, and with it some of the profit.

These are, however, only aids towards bringing about specialization, which in conjunction with combination is the spirit of the times, and I believe if we view the different classes of drug stores we can see by analysis that specialization has not yet progressed to its limit. I believe that we may prepare for drug stores where drugs, toilet and sundry articles are sold, and pharmacies where prescriptions are compounded, analyses and examinations are made for the physician, and medicinal articles and supplies for the sick room and patient are sold.

If these conditions result, it will necessitate a revision of our pharmacy laws. We will then be able to exact high qualifications of those who pursue pharmacy in fact, and of necessity have to modify the restrictions for those who are only vendors.

The colleges of pharmacy have advanced, in fact they have been among the leaders in the advance. The first decided advance in instruction was the establishment of chemical laboratories, in which the student could demonstrate his conception of the lectures he had received. Then followed the pharmaceutic, microscopic, analytic, and now the bacteriologic laboratories, in each of which the students give evidence of their capacity for actually doing the work which they are instructed in. There are now a few more than fifty schools, and forty-six of these date back no further than the history of our Association, most of them only to very recent times. The following data are taken from Bulletin No. 10 of the University of New York:

"Four of the colleges of pharmacy admit men only, forty-eight admit men and women; thirty-six hold day sessions, nine have night sessions, four have both, and three are unknown: forty-five grant degrees; thirty-eight are departments of universities or colleges; twenty-eight have a matriculation, forty-three a course fee, and fifty other fees; one requires a three year's high school course; six a two years'; eleven a one year's; twenty-four a common school; six no requirements, and four are not given; one has an eleven to twelve months' course; two a ten to eleven; five a nine to ten; ten an eight to nine; eleven a seven to eight, and eighteen less than seven, the average seven months; one maintains a four years' course; six a three years'; thirty-eight a two years'; seven a one year."

The curriculums have been added to year by year as science has progressed, and on account of the competition and the demand for a better understanding of the commercial side of the business in order to succeed, a business course has been added in many schools, more especially adapted to the drug business. The additional requirements and essentials to equip the student for active life must result in longer courses or additional ones, otherwise we will fail in conveying solid information that will be of lasting and substantial benefit. The time is coming when the schools of pharmacy will pay more attention to special courses in the several branches taught, on account of the prevalent specialization, and the individual will select the branch he is most interested in, and endeavor to perfect himself. Druggists will be called upon for positions as milk, food and meat inspectors, and be chosen for places on the boards of health. To perform these duties well and intelligently, opportunity should be afforded them to acquire the necessary knowledge in schools of pharmacy. It has been suggested that druggists cultivate medicinal plants, both for gain and investigation. The plan has been put into practice by several schools that have established such drug farms or gardens, and no doubt this will develop a much neglected field of work in this country, and bring beneficial results.

The pharmaceutical journals have now increased to the number of about fifty, from three or four fifty years ago. First of all, if it had not been for the advancement in pharmacy, they would not have multiplied, but with this said we must ascribe to these messengers much of the rapid and enlightened progression, for they bring us into close touch with our confreres and scatter fragments of information broadcast. They inspire the embryo pharmacist to seek advanced pharmaceutical knowledge, and persuade the

books; they convey a variety of formulæ of the same product from which, by comparison and experimentation, we devise the perfected ones.

With the advancement of pharmacy there also comes the call for an apprentice who has the capacity to progress, who has some of the fundamental knowledge that will enable him to battle with the requirements of scientific pharmacy hereafter. The apprentice of the past has been a youthful individual, whose prime and frequently sole qualifications were a willingness to use the sponge, broom and duster, and do other similar work. The youth advanced by virtue of perseverance and lapse of time to the position of clerk and ultimately proprietor. This condition of affairs has been in a large measure the cause of filling the ranks with men who retard the progression of our profession. If pharmacy maintains the same rate of progression in the fifty years to come that it has in the fifty years that have passed, it will be because more attention has been paid to the selection of apprentices than heretofore. It is fully as important that the youth entering upon his career as apprentice give evidence of his ability to hereafter cope intelligently with the problems that will confront him, as it is for the pharmacist to prove his ability and qualifications for recognizing drugs and chemicals and compounding them. Several States have already passed laws requiring registration, and it is to be hoped that all others will follow.

Admitting that a pharmacy law cannot be passed in every State of the high standard exacted in some, it is possible under the prevailing system of education in our country to select a youth, who can fulfill the requirements of any reasonable demands for apprenticeship in a drug store. We can here enter upon the same footing in every State, we can here comply with the same requirements, and starting even and abreast there is no reason why the pace of advancement should not be the same, so that eventually we can have laws that even though not quite of the same wording, will demand the same qualifications.

It is pleasing to note that several State Associations are establishing scholarships in schools of pharmacy of their respective States. Here is a glorious opportunity to exact the highest reasonable qualifications of the prospective ward, and thus bring into forceful evidence the exactions that should prevail in every instance for admission into all schools of pharmacy. I believe it possible for the schools to institute a reform in this direction. For years there have been preparatory schools for universities, from which, after an examination by a joint committee, the student obtained passports to them; the plan is leading to a general university examining board. The American Conference of Pharmaceutical Faculties will no doubt perfect a plan, which will carry the object sought for into execution. It is almost a matter of impossibility in this day of stuffing to provide a code of examination which will fit all applicants; but the educational requirements, experience and the evident aptitude can be ascertained from lines and rules that can be laid down. It goes without further argument that the better the preliminary education required the more satisfactory will be the progress made by the student, and the more credit will the graduate reflect upon the institution he emanates from, and correspondingly greater service will be rendered the profession.

Boards of Pharmacy examine applicants with a view of ascertaining their fitness to perform the duties required of them. To discover this requires a change of examination with nearly every applicant, for as has been well said by some one, "A phonograph could be made to pass the very best examination, except in practical work."

Pharmacy Boards of adjoining States, or of States where the status of pharmacy is on about an equal footing, should arrange their requirements and examinations, so that they would be willing to recognize the certificate of one as of sufficient merit to entitle the possessor to practice within the precincts of the other. I approve of this only under

the regulations which will demand that the applicant is a graduate in pharmacy. The fact that he has been passed upon by a school of pharmacy and shown his ability before a State Board of Pharmacy, should be ample evidence that he is competent to practice pharmacy in any State of the Union. This equalizing of standards should be encouraged and transmitted as fast as the respective States can comply. This will take time, but unless we make a start we cannot expect to accomplish it. Every year or two a new State can be enlisted. In every instance, no matter where, Pharmacy Boards should refuse to examine applicants who have not systematically applied themselves for a reasonable length of time to the study of the leading branches of pharmacy, nor should they re-examine an applicant, except for very plausible reasons, until sufficient time has elapsed for him to correct his deficiency. Graduation from a college of pharmacy should not preclude the necessity of a thorough examination, for obvious reasons.

The New York Board of Pharmacy are charged with the duty of inspecting drugs, and to see that they conform to the standard laid down in the Pharmacopoeia. This is a very important matter and should receive attention everywhere through some source for the protection of the public, and also of the conscientious pharmacist. Inert drugs may be more dangerous in a critical case than an overdose.

The commendable work of furthering the cause of the apothecaries in the Government's service is of much importance to us, and its success will have a substantial and elevating influence upon the profession.

The matter of regulating the hours of work and other surrounding conditions of the drug clerk is of much concern, and I am led to believe if this subject had been carefully studied years ago, conditions that tend to cut the profits of the druggist to-day would not be so wide-spread. Speaking generally, the hours of the drug clerk are too long and confining; he has little time for recreation and improvement, all of which tends to counteract the bright, energetic and wide-awake qualities he should possess. He therefore strives to enter business for himself at the earliest possible moment and become the competitor of him whom he could have aided and been aided by, and adds one more store to the number already too large, from which facts we can draw our conclusions. The organizations of drug clerks should be encouraged by proprietors, and by intelligent reasoning, conditions can be much improved. It is a step backward, however, for drug clerks to affiliate with labor unions; they have nothing in common with them. The possible work of a mechanic can be estimated and limitations fixed, but in the drug business we must provide for a great variety of emergencies and no fast rule can be established. The New York Legislature passed a shorter hours law last year, and while it is not complied with to the very letter, it has certainly brought about changes for the better. Sleeping rooms have been provided, where heretofore there were none, and the hours of duty lessened. This movement for the betterment of the drug clerk's condition has spread so that interest is exhibited in all sections of the country; the result will be of lasting benefit, and a material aid to the advancement of pharmacy.

It seems a matter of impossibility that pharmacy can continue to improve without close relationship with the medical profession, any more than medical laws can work to their full purpose unless with correspondingly good pharmacy laws and vice versa. A step in the right direction was taken when State Medical Associations were importuned to establish sections of *Materia Medica*, Pharmacy and Therapeutics. If the medical profession would give the attention to therapeutic action of drugs that they should, if they would fully appreciate what the Pharmacopoeia stands for, and if the pharmacists would closely adhere to the spirit of it, the continual hum and haw of counter-prescribing and substitution on the one hand and self-dispensing and nostrum prescribing on the other, would pass into a pale of insignificance. Through these Sections we can bring about a reformation. Much interest was manifested in this Section at the American Medical Association meeting, and if similar effort and enthusiasm can only become prevalent in the State

Associations, we may expect to derive much good for both professions. I believe it practical and of value for the National Medical Associations and the American Pharmaceutical Association to appoint a joint committee for the purpose of establishing standards for the materia medica products of the market. This committee to act in conjunction with medical colleges, schools of pharmacy, hospitals, and practitioners, who would test these products from every standpoint, and after due clinical investigation make a report of their results, with deductions. The culmination of such an effort will result in diminishing the number and kind of preparations that flood the market, the chief merit of which exists in the high-class literature every doctor receives in his daily mail. The objects and purposes can be extended and the aid of the manufacturers whose preparations represent nothing more nor less than they claim for them, can be depended on for valuable service: those who through deceptive language endeavor to impress the physician with an erroneous conception relative to the composition of their products, will, of course, pile up opposing argument.

In the event a proprietary is prescribed in connection with another drug and an incompatibility ensues which causes harm, the druggist is injured, even though he may not be held responsible by the courts. The restrictions of laws are made to apply to the druggist so as to prevent such occurrences, and still he is sometimes forced to compound, or rather mix preparations without the possibility of knowing what he has concocted.

I believe further, that an interest exhibited along this line will soon evolve a plan which would remove the unfair, if not unjust taxation we are subjected to by foreign manufacturers on products protected by the patent and trade mark laws of the United States. It would be feasible for the government to establish such a bureau, and in this effort they would be rendering the public a continual and beneficial service—not, as in the free distribution of serums, render service only to a few.

The Government has carried the free distribution of serums to an unwarranted excess, and by this wholesale free delivery has encouraged states, cities and public institutions to adopt like methods, with the result of becoming competitors of private enterprises from whom they draw at least in part the means expended to do them harm. The manufacturers of these biological products have expended large sums of money to carry on their work in accordance with the most approved scientific methods, and are entitled to fair remuneration. They ought not to be selected as a class with whom the Federal, State and municipal governments should compete upon an unreasonable basis. I hope the Association will consider the advisability of addressing Congress relative to this matter, importuning them to discontinue this extensive free distribution.

The free dispensary is another evil in disguise. The ideas that prompted them are worthy indeed; however, the numerous selfish subjects of humanity who are not necessitated to apply for such charity, but through penuriousness do so, should be made amenable. A joint committee of the State Medical and Pharmaceutical Association of Pennsylvania recommended the passage of a law, requiring all recipients of medicine to register and providing a penalty for those who imposed upon the hospital authorities.

The restrictions placed upon the practice of pharmacy in the United States, with only one exception, date back no further than the American Pharmaceutical Association, and to its efforts we can, without presumption, ascribe the existence of these laws to-day. Through no fault of the Association, the laws vary almost with the number and without logical grounds. In view of these conditions the existing laws should be amended, so that in the main they will resemble the "Model Pharmacy Law," and states whose laws are closely akin should be made to coincide on the nearest approach to it, and thus aid in bringing about a possible reciprocity among boards of pharmacy of these states. It has already been suggested that the licensed pharmacist should be a graduate in pharmacy, and while at present this would be impossible in most states, there are states the venture could be made in without injury to any one or to the cause. There are state

laws that recognize diplomas of physicians and pharmacists as a means of securing registration, which feature ought to be removed. A high school or at least a grammar school education, together with practical experience in pharmacy, ought to be demanded of the applicant for examination. Our profession places in the hands of the votary moral obligations of a high standard, and he whose character permits him to trifle with human life or health, or encourage the frailties of human nature, has no right in the ranks; therefore the qualifications of moral character expressed in the laws should be a matter of more important consideration than is frequently the case.

The boards of pharmacy should be chosen from a point of fitness morally, as also through being qualified by knowledge and experience, not through favoritism or friendship. Politics ought certainly not to govern, for their conclusions either protect or endanger public health. They are in reality the ones who can make pharmacy laws a protection for the public, if they are competent themselves; if they are not, then at least the druggist has sustained a loss and the public has gained nothing. State pharmaceutical associations should interest themselves directly in this provision and importune the respective governors to appoint men out of a number they present to him for consideration.

The American Medical Association has been discussing the possibilities of a national board for registration, to be appointed from among the physicians and surgeons in the government service. A suggestion has been made that a national board of pharmacy could be established on similar lines. The idea is one that would be accepted with pleasure if it were practical; but with the present status of pharmacy, the necessity of variance in the laws on account of local conditions, it will be unfeasible for years to come.

In some localities the renting of certificates has become quite prevalent, evidencing a very meagre amount of moral character in the owner, and appeals to continual watchfulness of the profession at large to assist the board of pharmacy in detecting such irregularities.

It is very important that the proceedings of State legislatures be watched very closely to prevent the passage of laws which may work harm or exact duties, expensive, annoying and difficult to comply with. The legislative mills of the past year give us striking evidence of this fact: as an example, if it had not been for such precautions, some of our friends would have been required to cork bottles containing poisons with a specified brand of cork. Efforts were even made to set aside the necessity of examination in the case of an individual for reasons as ridiculous as the proposition itself.

In Massachusetts a relic of the blue laws, prohibiting sales in drug stores on the Sabbath of other than medicines, was enforced to the letter, causing many druggists to pay fines. The result was that a united effort influenced the legislature to remove the restrictions. New York had passed a law several years ago prohibiting the charging of soda fountains in buildings used for other purposes, and this year an effort was made to pass similar laws in other States. The latter efforts were defeated, and the existing law in New York State repealed. Ohio passed a law prohibiting the promiscuous distribution of medicine samples, which is very wise and timely; but has not the time come to go a little further? The papers all contain glaring advertisements of what this and that remedy will do for the disease indicated by such a variety of symptoms, that the man of finest physique is bound to believe himself in the very jaws of death. This leads to the enormous consumption of remedies, some of which are bound to contain substances that are not intended for daily consumption.

These same people who load the human mind with exaggerations and the stomach with medicines, whether they are indicated or not, make no bones about vituperating the whole profession through charges possibly sustained in a few instances, and then appeal to you to sell their goods instead of your own. You are restricted by laws that make you

responsible for goods you sell; you are required to possess a degree of knowledge because it is necessary to exercise it in the compounding and vending of medicines and poisons; but where is the restriction upon the sale of that which constitutes the greater bulk of medicine swallowed by the American citizen? The manufacturers who have preparations of merit will not fear legislation of this character; they will support it.

With the increased legislation relative to pure foods and drugs comes the thought of what standard shall apply to what we term commercial drugs. It will become necessary for some one, or rather some bodies, to fix a standard for these that will be considered accepted authority. We cannot permit the Pharmacopoeia to be designated as such authority, for the drugs, galenicals and chemicals described therein are of the highest standard.

Right along in this line also comes the question of the harmfulness of preservatives, and to what extent they may be used in food products to be consumed by the hungry mortals. This is a question of no little moment when articles of food are increasing in daily use which contain more or less of what we denominate preservatives. This subject ought to receive the consideration of interested bodies here and abroad, and a fixed amount be designated as within the limits of doing harm when used in the various foods and food-stuffs, or it is even of such importance that the standard be fixed by an international commission of disinterested scientific men.

The general use of wood alcohol has increased materially, and the danger of it ought to be impressed upon the public with a poison label. The use of it in any remedy ought to be discouraged, for this simply prepares for further ventures by the ignorant and indifferent. Articles sold at retail and wholesale should be labeled with the official English name, and the synonym should not be used, as danger may lurk, owing to the fact of great variance in local application of these names. The Scientific Section acted wisely in endorsing the suggestion of labeling as creosote only beech-wood tar creosote, the so-called under its proper designation. The idea is meeting the approbation of manufacturers and jobbers and should be encouraged by the retailers, both in their purchases and sales.

One of the most recent of poison laws, and one that covers the ground as well, if not better than any other extant, is the one passed by the Ohio Legislature, which is a deduction from the poison section of the American Pharmaceutical Association Model Pharmacy Law. Many of the poison laws are more or less defective, and it would not be a bad idea, wherever and whenever possible, to substitute the above.

Cocaine and morphine laws have been enacted by states and municipalities, many of which cannot readily be complied with by the druggist without inflicting hardships upon the public. The Pennsylvania law, in my estimation, comes nearer being a satisfactory model than any other, and while the observation of the restrictions implied is largely left with the druggist, the legal restrictions can be enforced if the necessary attention, which such affliction is worthy of, is given to it by the public. The druggist is charged with moral obligations that require him to be a man of character, and if we guard the exactions of pharmacy laws along this line, the intent of such laws is observed, even if there are no laws. The enforcement of laws of this character depend more upon the moral stamina of the dealer than the terror of the law. There are other drugs gradually coming into use by habitués, and the subject is of such importance that a committee was appointed by this Association, who will no doubt have an interesting report.

The sale of spirituous liquors by the druggist, no matter under what conditions, works oftener an injury to the individual and the profession, than in my estimation is warranted by the pecuniary or any other gain or benefit to the public or druggist. Under date of October 8, 1901, the Commissioner of Internal Revenue, John W. Yerkes, issued a circular letter to collectors of internal revenue, the purport of which is, that druggists may compound wines and spirits with drugs and sell them, but not unless so

compounded, and then only when they are to be used as medicines exclusively, without paying the United States Retail Liquor Dealer's license. The same ruling applies to bitters, tonics, etc., and the test in all cases is: "Was the compound sold in good faith for medicinal purposes only, or was it sold as a beverage, or sold knowingly to persons who bought it for use as a beverage?" I believe the druggist can limit his dealings in these articles in full compliance with these instructions, and not be pestered with persecutions and reflections.

United States Senator Spooner has introduced a bill to regulate the sale of serums, viruses, antitoxins and analogous products and thereby protect the public so far as Congress has jurisdiction. Fatalities have occurred, and it would be no unwise step for States to take similar action.

Congress provided for the refunding of excess tax paid on tobacco, cigars and snuff, evidencing a recognition of the principle that taxes should not continue to be paid after the law is repealed; no such provision, however, was made for patent and proprietary medicines. The excess tax on tobacco has been refunded and the interested bodies of the latter class hope to meet with the same success, and no doubt their cause is a just one, for the same principle seems to be involved.

During the past year several of the universities and colleges inaugurated technical courses for the training of their students, who desire to fit themselves for commercial pursuits. This is a striking acknowledgment of the necessity for such endeavor and an evidence of the growing need for such qualifications in this day of large enterprises and well-defined methods for transacting business. The courses outlined for this work are very complete and deal with the subject in every phase, from the origin and manufacture of the product to the means of conveyance, control of the men, and the management of the store and factory.

The methods of organization, handling of capital, and the pursuit of business generally in all its details, receives most accurate and systematic consideration. It has already been suggested that schools of pharmacy have entered upon similar work, and it is indeed no unworthy step, for to be equipped with sufficient knowledge of business affairs, to be equal to any occasion presented, is a most valuable accomplishment.

To transact the business of a drug store in a systematic and accurate manner is of a very significant importance to the career of the proprietor and adds materially to his standing in the commercial world. After all, while we lay stress upon the professional side of pharmacy, and we can hardly be too positive in this, yet we must receive from our labors sufficient remuneration to provide for the family and the advance of years, or our endeavors are in vain.

The trend in the business world is towards combination, and the drug business offers no exception. We have this year learned of combines in every section of the country who own a number of drug stores; even in the smaller towns we hear of druggists forming partnerships, and while they continue to run the stores under their respective names, they work together and divide their profits at the end of the year.

The economy of the larger concerns, however, exists in having central supply and manufacturing departments, through which the number of clerks and expenses are reduced, the best discounts and prices are obtained, and also making it possible to employ the most competent help for the laboratory and prescription department, because the cost of such help is borne by several or quite a number of stores. The management of such combines will be composed of men having executive ability, of those who are informed in the art and science of pharmacy and others who have the tact of handling trade.

It may be surmised that with such qualifications through combination, which are scarcely, if ever, possessed by one man, they can offer inducements and conduct their affairs with much more certainty of successful results than can be done by an individual.

The further results will be a more ideal drug store, in which both commercial and professional sides will be advanced. The chances are that the proportionate number of drug stores will decrease through absorption and succumbing to the active competition, which the individual cannot in every instance cope with. These developments are a gradual evolution, and those interested shape their affairs with the movement.

We look forward and anticipate great changes, but if we take a retrospect and compare the times, we will observe changes of very similar proportion. Our lives are largely what we make them, the history of any trade or profession is simply the result of the acts of those engaged in them.

Just one more remark and I conclude: We ought to leave a tangible record or evidence of the means we used in the pursuit of our calling for posterity to read up from. How very interesting it would be if we had more evidences of the condition of pharmacy fifty years ago, together with the utensils then in use.

THE CHAIR: Last but not least! The American Pharmaceutical Association, at its fiftieth anniversary meeting, has entered upon the duties of its Section on Education and Legislation. We have well nigh been satiated with good things in the way of papers, discussions and addresses, but I trust this will not prevent the members of the Association from giving as much time and attention to the work of this Section as it deserves. I am sure I am guilty of no exaggeration when I make the statement that some of the most important problems that confront the American pharmacists to-day are questions of an educational nature. The future member of this Association will be educated in the next decade, in our colleges of pharmacy, and the ideas that are inculcated in his mind and heart by his *alma mater* will be the ones which will guide him in life. We have listened to the address of our Chairman, who has dealt with the problems that have confronted the Association in the past and those we shall have to grapple with now. What is the pleasure of the Section as to its disposition?

Mr. Koch moved to receive and refer to a special committee of three for consideration and report at the next session, and the motion was put and carried.

THE CHAIR: As a committee representing the two interests of pharmacy embraced in the work of this Section, I will appoint Mr. Geo. B. Kauffman as representing the educational interest, and Mr. A. E. Ebert and Mr. H. B. Mason the legislative interest.

Mr. Eberle resumed the chair and called for the report of the Secretary, which Mr. Knox read as follows, receiving the applause of those present:

REPORT OF THE SECRETARY OF THE SECTION ON EDUCATION AND LEGISLATION.

As only about fourteen state legislatures have been in session since our last meeting, the volume of pharmaceutical legislation during the past year has been small, although in some cases, of considerable importance.

Maryland has an entirely new law, which, while not all that could be desired, is a good beginning.

In several states laws have been passed prohibiting the distribution of sample medicines except under certain restrictions. There have been less than the usual number of bills to permit physicians to register without examination, and all have been defeated.

A feature of the past year's legislation is the attempted regulation of the sale of cocaine. Undoubtedly we may expect many such bills next year, and the information gained by observing the practical operations of such laws as we now have should be of value in constructing further legislation along this line.

The year has been nearly as remarkable for bills defeated as for those passed. In several states bills in the interests of bottlers were introduced whose effect would have been to prevent druggists from doing their own carbonating on the premises. Without exception these bills were defeated, and in New York, where such a law had been quietly slipped through an amendment was passed exempting druggists from its operations.

Liquor legislation cut very little figure during the past year except in Ohio, where the measures proposed were so extreme and so manifestly unjust that they were defeated without great difficulty.

The review by states is as follows:

District of Columbia: A bill to regulate the sale of poisons was introduced in Congress but met with considerable opposition and was defeated. The District Commissioners passed an ordinance prohibiting house-to-house sampling of medicines without the consent of the owners or occupants of the premises.

Georgia: A bill providing for general reorganization of state troops was amended so as to secure for pharmacists 2d lieutenants' commissions in the state militia and rank as ensigns in the naval reserves. The amendment was unanimously adopted by the Senate but the bill was held over in the House and failed of passage.

Iowa: A law prohibiting the sale of cocaine or any preparation containing it, except on physician's prescription was adopted. Liquor legislation was also attempted in this state but I believe without success, although I have been unable to get definite information.

Kentucky: The pharmacy act was amended so as to prohibit the sale of emmenagogues and preparations containing them, whether "patent" or otherwise, except on physician's prescriptions. Another amendment prohibits the retailing of cocaine and its salts except upon the prescription of a legally qualified physician or dentist.

Louisiana: Pharmacy act amended so as to permit registration only by examination and after experience of four years for registered pharmacist, or of two years for assistant pharmacist. The amendment also provides for quadrennial re-registration.

Maryland: A new pharmacy law was finally passed, which although quite different from the one hoped for by the druggists has several excellent features. It provides for registration of persons actively engaged in business when the act was passed, and requires future registration by examination after an experience of four years in the case of registered pharmacists, or two years for assistants. The law took effect July 1st.

Massachusetts: Laws were passed authorizing the Board of Pharmacy to reconsider its action in cases where it suspended or revoked certificates of registration; to permit the widow, executor or administrator of a deceased pharmacist to conduct the business under a registered licensee's personal supervision; to permit the sale of ice cream, soda water and confectionary on Sunday; establishing the salaries of the Board of Pharmacy, and making appropriations to meet said salaries. Measures that were defeated were as follows: To prohibit the manufacture of soda water in any building used in whole or in part for residence purposes; requiring all prescriptions to be written in the English language; prohibiting the sale of cigarettes; requiring labels of "face bleaches" and similar cosmetic preparations containing poisons to bear a list of the ingredients used in their manufacture; to provide for the registration of assistant pharmacists; to authorize the State Board of Health to engage in the manufacture of diphtheria antitoxin and vaccine lymph; requiring all "patent" or secret medicines to bear a label stating their full composition.

New York: A bill changing the method of electing members of the eastern branch

pharmaceutical society, residing in the district, are permitted to participate. Owing to ambiguity of the wording of this law, there was some confusion among the druggists residing in the district. The Attorney-General, being appealed to, ruled that the law required the election of five new members, instead of one, but Justice Blanchard, of the Supreme Court, held that only one member was to be elected, and the election was proceeded with accordingly.

A bill was passed exempting druggists and others, who have their own carbonating plant, from the provisions of the law relating to the manufacture of explosives in buildings used for residence purposes. Another bill requires department stores, grocers and others selling certain household articles, such as borax, sodium bicarbonate, etc., to conform to the standard of the U. S. P.

Among the unsuccessful measures were the following: to permit physicians to practice pharmacy without examination; requiring bottles containing poisons to be stoppered with a special kind of a cork—this bill being manifestly in the interest of a private enterprise; to prevent careless and indiscriminate sampling of medicinal preparations.

Ohio: A new poison law was passed and becomes effective January 1, 1903. This does away with the ambiguity of the old law which caused considerable friction from time to time, and is modeled after that section of the A. Ph. A. model pharmacy law. A law intended to regulate the sale of cocaine was passed, but is probably of little value, since it merely mentions the alkaloid and says nothing about its salts, whereas practically all the cocaine used is in the form of salts. The pharmacy law was amended to define the branches in which applicants for registration should be examined. These branches are specified as chemistry, botany, materia medica, toxicology and the theory and practice of pharmacy. An "anti-sampling" bill also became law. The obnoxious Middleton liquor law was repealed.

Other bills, all of which were unsuccessful, and were strongly opposed by the druggists were: providing for the collection of a liquor tax from every druggist who pays the U. S. revenue tax of \$25; forbidding the manufacture of soda water on the premises; a retroactive bill providing for the collection of seven years' back liquor taxes from druggists who pay the U. S. internal revenue \$25 tax.

A special bill permitting certain persons to be registered without examination was defeated.

Virginia: The legislature had the usual number of iniquitous special bills granting certain persons the right to practice pharmacy without passing an examination. The druggists have succeeded in getting a clause into the new constitution of that State, the effect of which will be to put an end to this obnoxious special legislation.

	Registered Last Year.						Women on Rolls	End of Board Year.
	Total on Rolls.		By Exam- ination.		Without Exam- ination.			
	R. P.	A. P.	R. P.	A. P.	R. P.	A. P.		
Alabama *	955		37					
Arkansas	1099		39		11		1	11-12-01
California	2341	369	79	11	312	235		6-30-02
Colorado	719	35	81	17			6	7-1-02
Connecticut	898		82		35		15	6-1-02
Delaware *	185	34	6					6-1-01
District of Columbia	879		10		23			7-1-02
Florida	637		9		25			1-1-02
Georgia	1449		53		13		5	11-1-01
Idaho								
Illinois	4465	1152	207	173			96	12-31-01
Indiana	5126	441	38	18				7-8-02
Iowa	3510		338		229		75	4-23-02
Kansas	1524	49	100	14			6	5-29-02
Kentucky	1890		56				15	10-10-01
Louisiana	1087	281	64	27	4		15	5-1-02
Maine	610	47	25	8			4	12-31-01
Maryland	964	148	57		907	148	14	7-1-03
Massachusetts	4027		90				85	9-30-01
Michigan	3185	356	100	54				6-30-02
Minnesota	1385	230	93	82	9		26	12-31-01
Mississippi	1150		36				5	4-2-02
Missouri	15395		42		55			7-31-02
Montana	240	16	22					
Nebraska	1465		54					11-30-01
Nevada	55							5-5-02
New Hampshire	699	90	15	7			1	9-1-01
New Jersey	1690	41	72	16			8	6-1-02
New Mexico	94	3	6		7		2	8-31-01
New York—								
Eastern	7690		317	35	222	70		12-31-01
Middle *	6454		240					
Western *	155	40	25	15				
North Carolina *	647		60					6-1-02
North Dakota	336	134	43		19	53	2	7-31-02
Ohio	3408	739	119	122	1			4-30-02
Oklahoma	338	4	82	2	7	1	12	6-30-02
Oregon	551	61	28	24				5-21-02
Pennsylvania	5600	2250	425	515			62	6-30-02
Rhode Island	278	185	3	20				7-1-02
South Carolina *	290		10					
South Dakota	485	27	41	9			5	8-15-02
Tennessee	1211	66	19	10	20		10	4-21-02
Texas *	1550							
Utah *	275	42						
Vermont	400		13				2	8-31-02
Virginia	800	150	45	20	36		2	3-1-02
Washington *	615	43	62	10				5-31-02
West Virginia *	1262		22					4-1-02
Wisconsin	1428	385	38	63	11		38	9-1-01
Wyoming								
	91496	7418	3403	1272	2723	507	720	

* Estimated.

No reports were received from Alabama, Delaware, New York middle and western branches, North Carolina, South Carolina, Utah, Washington and West Virginia. The necessity of submitting mere estimates for these states detracts materially from the value, at best problematical, of these statistics. Nor is this the only element of uncertainty, for comparison of some of the secretaries' statements with published reports in the journals shows them so greatly at variance that I am left in doubt as to the accuracy of any of the figures submitted by such secretaries. For example, one states that there had been no registrations on pharmaceutical diplomas during the past year, while in the drug journals I found a list over his own name of eight persons who had been so registered during that period. Some others have reported no pharmaceutical legislation attempted, although some very important bills had been introduced in the legislatures of their states.

However, I would not be understood as making a wholesale accusation of ~~whiphod~~ carelessness; on the contrary, I have no reason whatever to doubt the entire accuracy of the information furnished me by a great majority of the secretaries. But so long as there are some who either keep no records or lack the energy to transcribe a few figures correctly, it is very evident that the statistical reports of the Secretary of this Section will leave much to be desired in the way of accuracy. By way of acknowledgment I will say that nearly all who responded to my communication did so very promptly, and doubtless those who failed to do so were guilty of nothing worse than procrastination.

J. W. KNOX, *Secretary*.

THE CHAIRMAN: Gentlemen, you have heard the report of your Secretary. What is your pleasure?

MR. HALLBERG: I move that it be referred for publication. And in that connection I want to say that I think it is important that whatever changes in pharmaceutical legislation occur during the year should appear in detail in the Proceedings—the features of the laws that have been passed. Last year's report on legislation in the different States did not do that. Some of the States had no pharmacy laws, and we ought to know what the changes are. That report was decidedly unsatisfactory and incomplete in this respect. I know I desired to refer to these changes, and found that, while there was an elaborate report, it did not contain the details I wanted. It has always been customary to do this, and I think we should continue it. I simply call attention to our lapse in this regard; I suppose no motion in the matter is necessary.

MR. RYAN: I would like to ask the mover of the motion a moment ago if he will permit me to substitute a reference of the Secretary's report to the same committee that has the President's report in hand. I should be glad to have the same committee review this report.

THE CHAIRMAN: There was no motion made by Mr. Hallberg.

MR. RYAN: I make that as a motion, then.

The motion was seconded by Mr. Hallberg and carried.

Mr. Whelpley here appeared on the floor to ask the new members of the Council to attend its meeting now about to be held for reorganization, and Chairman Eberle said he would have to ask the Section to excuse him so he could attend that meeting. He then called on the Secretary to read a set of resolutions offered by Mr. Sheppard, of Boston, and asked Mr. Ryan to take the chair.

The resolutions offered were as follows:

WHEREAS, We, the members of the American Pharmaceutical Association, believe that

of health throughout the United States are liable to grave abuses and unjust to those who are engaged in the manufacture of these products; and

Whereas, There is, in our opinion, no more reason for such extravagant expenditure of the public funds than there is for the wholesale free distribution of food and clothing; and

Whereas, It is well known that serums and vaccines are furnished to thousands who are in no need of charitable aid; and

Whereas, The experience in St. Louis, Mo., where fourteen children lost their lives through the use of impure antitoxin manufactured in the laboratory of the St. Louis City Board of Health, directs attention to the inexpediency of intrusting the making of such preparations to the boards of health dominated by political influence; and

Whereas, It has been found that where boards of health have the power to manufacture or give away vaccine virus or antitoxin the sales of the articles by druggists even in favored localities have been seriously interfered with; be it

Resolved, (1) That it is the sense of the American Pharmaceutical Association that boards of health are acting beyond the duties especially assigned them in manufacturing, selling or giving away, except to the destitute, any remedial agents, serums, vaccines, etc., (2) That in so doing they interfere with the discharge of their own legitimate duties, the interests of manufacturers, retailers and the drug trade generally, to the detriment of the whole community.

Mr. Mayo seconded the adoption of the resolution.

MR. SHEPPARD: This matter has been very earnestly discussed in Massachusetts during the past year, in connection with the action of our Legislature. The Board of Health of Massachusetts has been very active in this direction, and we think, many of us, very wrongfully so. They have given away not less than fifteen thousand bottles of serum, according to their own reports, and we know the great bulk of that has gone to people who could well afford to pay for it. A druggist doing business on the Back Bay in Boston, tells us there is about as much distributed there as in the North End. Now, we believe there is a movement in the air—not only in Massachusetts, but all over the country—to carry these ideas away beyond their reasonable limit. We would not discourage in the least the furnishing of serum and vaccine virus to those who are destitute, wherever it is needed for the good of the public or for the protection of any particular locality from contagion; but we believe that this Association—as well as our State Association, where it was approved—should put itself on record as against the indiscriminate distribution of these serums by government authority.

MR. MASON: Was there any statement contained in these resolutions by means of which the resolutions would be addressed to Congress? As a member of the committee, in looking at the Chairman's address I find these words: "I hope the Association will consider the advisability of addressing Congress relative to this matter, importuning them to discontinue this extensive free distribution." Now, it seems to me it would be a waste of time and a useless repetition to pass these resolutions at this time, and then have the committee, of which I am a member, bring in resolutions to the same effect.

THE CHAIR: We should first take a vote on the adoption of these resolutions, unless you wish to offer a substitute for the other motion.

MR. MASON: I move as an amendment to the resolution, that a copy of the resolution be sent to Congress, according to the recommendation of the Chairman of this Section.

THE CHAIR: You have heard the amendment to the resolution, to the effect that Con-

The question was then put to a vote and carried.

THE CHAIR: The next order of business is the report of the Committee on Habitual Use of Narcotics, H. P. Hynson, chairman.

MR. HYNSON: I want to explain that this report is not a chairman's report, but a report of the committee. I have weighed every word in this report, and I think every sentence in it ought to have your careful consideration.

Mr. Hynson then read the report as follows :

REPORT OF COMMITTEE ON ACQUIREMENT OF THE DRUG HABIT.

Viewed from a distance, the making of this report—like many a task, many a difficulty—seemed small indeed, but upon nearer approach it has, in the minds of your committeemen, become stupendous.

The duty of the committee was not well defined by the resolution creating it, nor is the specific purpose for which we were appointed, even yet, quite clearly shown.

That habits are formed for the use of certain drugs is a fact so well known to us all as to need no further proving; that such habits are injurious to the health, morals and general well-being of the habitues is quite well established. A discussion, therefore, of these two points is totally unnecessary. This positive knowledge regarding the existence and effects of the drug habit assures us that the personal knowledge of the individual pharmacist, touching other points connected with this awful curse, if fully and truthfully valued, will force upon the conscientious, conclusions that will win from them a ready recognition of their responsibilities.

This personal knowledge, this individual experience, entails a responsibility and an accounting far more exacting than any that can be placed upon you by the efforts of this committee. It is folly for any one to say he knows nothing of this matter because organized investigation has not been made, or because statistics have not been furnished. The experience of one is the experience of the multitude, and no life is so singular as to have carried its owner even a little distance along the way without presenting much the same scenes that have been clearly viewed by the many. It will be becoming, therefore, while further discussing this subject, for the individual to lend the help of his experience and the force of his real knowledge.

In addition to this there are several questions which your committee thinks it may assist in answering, viz. :

1. Is the use of habit-forming drugs unduly increasing?
2. What is the probable number of habitues?
3. Is there danger in some of our newer drugs and popular remedies?

used by habitues?

5. What is the responsibility of pharmacists in the matter?

6. What can be done by this Section and this Association to lessen the evil?

To the first question nearly all of us from personal observation will give a decidedly affirmative answer. This opinion will be, we think, supported by the very best authority—by reports from the United States Treasury Department. Believing that all habit-forming drugs are imported into this country either in crude or manufactured form, your committee has thought that data of this kind would afford the simplest and surest means of answering the question.

Through the kindness of Col. W. H. Love, Secretary to the Board of Trade, Baltimore, and the courtesy of Chief of the Bureau of Statistics, O. P. Austin, we are able to give a very accurate and complete report of the importations of opium and coca with their derivatives for the last five years.

IMPORTATIONS.

DATE.	QUANTITIES.			VALUES.					TOTALS.	
	Opium, Medicinal.	Opium, Smoking.	Morphine and Salts.	Opium, Medicinal.	Opium, Smoking.	Morphine and Salts.	Coca Leaves.	Cocaine and Salts.	Opium and Morphine.	Coca and Cocaine.
	Lbs.	Lbs.	Oz.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
1898	72,287	117,298	25,791	162,652	791,379	35,659	53,752	59,660	989,690	113,412
1899	343,283	127,082	13,081	833,751	837,456	35,357	28,388	40,141	1,706,564	68,529
1900	537,004	129,336	26,208	1,137,762	938,524	75,274	591	112,373	2,151,560	112,966
1901	491,448	139,515	50,819	1,030,209	1,141,518	147,517	483	176,948	2,319,234	177,421
1902	548,674	163,442	38,002	1,263,369	1,190,493	96,559	.....	254,704	2,549,421	254,704

It should be noticed that where there is a decrease of the derivative there is a corresponding larger increase in the crude product and *vice versa*, showing, also, the decrease in manufacture of cocaine and the increase of morphine manufactured in the United States. The increase in population in the last five years has been 10 per cent. A careful investigation among physicians assures us that the legitimate use of cocaine has not increased, since its greater use in general surgery is offset by a more careful use in nose and throat work and in general practice. Because of its now known dangerous character it is, of late, seldom ordered in a prescription to be handled by the patient. The use of cocaine in operative surgery and the relief of pain by the advances in surgery largely tend to lessen the legitimate use of morphine. The prices of these products vary

per cent. in the imports of cocaine is very significant; while the increase of nearly 500 per cent. in the quantities and over 600 per cent. in the values of opium and morphine is simply startling.

As this report is being prepared, a despatch comes from San Francisco announcing that over \$1,000,000 worth of opium has just reached that port of entry in one cargo. If true, the receipts for the next year will be unprecedentedly foreboding.

That it might, in a measure, answer some of the other questions, your committee has thought wise to send out return postal cards to a number of pharmacists and physicians in different localities, as follows:

AMERICAN PHARMACEUTICAL ASSOCIATION.

Special Committee on the Question of the Acquirement of the Drug Habit.

Dear Sir: As a member of the above committee I earnestly beg your prompt co-operation. Kindly fill out the blanks on the attached return-card, which you will please mail.

Should you prefer not to be known in the report, the card may be mailed without your signature; please give the matter your serious attention, however, and make your report as accurate and complete as possible.

ON THE QUESTION OF THE ACQUIREMENT OF THE DRUG HABIT.

How many persons do you know who have a drug habit?

Have you noticed a seemingly unwarranted use of sulfonal and trional?

Do you believe habits are formed for the popular headache remedies?

How many persons do you know who have a habit for the following: Opium (crude); laudanum (including deod. tincture and McMunn's elixir); paregoric; morphine (including hypodermic use); cocaine; trional; sulfonal; headache cures?

Four hundred were sent to pharmacists in New York and Brooklyn, 250 to pharmacists and physicians in Philadelphia, 100 to pharmacists in Baltimore, 100 to physicians in Baltimore, 50 to pharmacists in towns of Pennsylvania and New Jersey, with results given in following table:

	Town.	Philadelphia.	Baltimore.	New York.	Pharmacists.	Physicians.	Averages.
1. Percentage of those to whom cards were sent reporting.....	50	36	22	21	22	16	26
2. Average number of habitues known to each person reporting	7	3	5	5	4	6	5
3. Percentage reporting an unwarranted use of trional and sulfonal.....	8	12	27	14	19	33	18
4. Percentage reporting no unwarranted use of trional and sulfonal.....	92	68	53	70	50	57	66
5. Percentage not reporting on sulfonal and trional	0	20	20	16	31	10	16
6. Percentage reporting a belief that habits are formed for headache cures ..	50	24	70	42	54	90	57
7. Percentage reporting any unbelief that habits are formed for headache cures.....	42	60	10	43	14	1	28
8. Percentage not reporting on headache cures ..	8	16	20	15	32	1	15
9. Percentage of habitues using crude opium.....	20	2	7	8	6	7	8
10. Percentage of habitues using laudanum	32	17	15	11	20	9	17
11. Percentage of habitues using paregoric.....	4	15	10	9	9	10	9
12. Percentage of habitues using morphine.....	50	18	20	25	18	30	26
13. Percentage of habitues using cocaine.....	35	10	11	18	6	13	15
14. Percentage of habitues using trional	17	2	3	4	2	4	5
15. Percentage of habitues using sulfonal	16	1	2	3	0	3	4
16. Percentage of habitues using headache cures ..	7	19	28	22	30	25	21

The responses were better than is usual from such efforts, which have always proven to be the most effective for securing statistics. We hereby thank and commend all those who were kind enough to respond; the attention is highly appreciated by the committee. Although several of our kind friends advised us that it was "a poor way to get such information" they did not suggest any better plan, and while we agree with them that those who could give the most valuable information would be the last to offer it, we believe the results will prove interesting and be of some value.

From the reports made, and because "those who knew the least said the most," and supported by two commendably frank gentlemen who had been in favorable positions to know—one in the "tenderloin" of Philadelphia, the other in a "peculiar locality" of New York, and who reported habitues by the "hundred and more"—we believe it is quite safe to estimate that at least five different unfortunates of this class are known to every pharmacist, making at least 200,000 in this country, or about three to every 1,000 of our population.

The use of cocaine by unfortunate women generally and by negroes in certain parts of the country is simply appalling. No idea of this can be had unless personally investigated. The police officers of these questionable districts tell us that the habitues are made madly wild by cocaine, which they have no difficulty at all in buying, it sometimes being peddled around from door to door, but always adulterated with acetanilid. Touching this special phase of the practice, we are allowed to quote the two

hundred habitues, 2 using opium, 5 using laudanum, 100 cocaine, 100 morphine, 20 trional, 5 sulfonal. He writes: "Being in a peculiar neighborhood, I find the above-mentioned drugs abused to an awful extent. Very few care to better themselves if it were possible."

Another pharmacist writes interestingly as follows: "I spent a few months in a pharmacy located in what is known as the 'tenderloin district' in this city. From my personal observation I can say that the number of men and women, in the prime of life, addicted to the laudanum, paregoric, morphine and cocaine habits is appalling.

"Cocaine, of which the muriate is generally sold, is dispensed in crystals and also in solution, as ordered by the customer, and is used by the fiend by mouth and hypodermically. A considerable amount of cocaine is also disposed of in the form of catarrh snuff; the buyers of this article, being acquainted with the nature of it, buy it to get the desired effect.

"One case, in particular, that came under my notice, is a young man, I should judge not over thirty years of age, whose limbs were literally covered with marks from the hypodermic needle. Laudanum sold to fiends is, as a rule, a 50 per cent. preparation, *i. e.*, tincture of opium diluted with an equal volume of diluted alcohol and colored with caramel.

"The amount of paregoric sold in the 'tenderloin' is comparatively small."

All this in spite of a friend who writes us, "some people think a flea is an elephant; there is not one person in a thousand who has a drug habit." Three to one thousand was the exact number, with pronounced habits, committed to one of our city jails during the last two years. The comparative extent to which the several drugs are used is given in the table. It is only necessary, in this connection, to call attention to the fact that quite a percentage of pharmacists and physicians are of the opinion that habits are formed for sulfonal, trional and the popular headache remedies—an amply sufficient number to warrant a thorough investigation of this particular part of the subject, and to suggest caution in the use of these products.

It is not the opinion of this committee that narcotics are largely used in headache cures, nor do we believe seduction comes from the caffeine or the acetanilid alone, but to the combination of these, or a product of the combination. Preparations containing caffeine and potassium bromide and no acetanilid do not appear to produce the pleasantly stimulating effect that the addition of the latter gives. All this offers another subject worthy of investigation.

Besides the drugs and preparations listed, habits were reported for chloroform, ether, bromidia and several brands of catarrh snuff. Our correspondents, in considerable number, condemn these snuffs as being extremely vicious. They have no doubt that they contain cocaine, and

danger of continuing the use of suppositories containing opium or morphine is often overlooked. Besides the information to which we have already referred, we have consulted police officers, jail physicians and eminent specialists in nervous and mental diseases, physicians to insane asylums and sanatoriums, and they all unite in declaring the abuse of narcotic drugs to be on the increase, with results indescribably bad. Much of the insanity and nervous derangement prevalent is noticeably due to the drug habit and crime is often directly traceable to its impulses. Opium and cocaine are much more brutalizing than is alcohol, with the additional horror of steady and certain progress and almost absolute absence of reform.

With the exception of proprietary and patent preparations containing these drugs, and the opium for smoking, these drugs are entirely in the control of the drug trade as represented by jobber, manufacturer and dispenser. The responsibility thus resting is frankly acknowledged by many honorable and manly pharmacists, greatly to their credit. Many of our correspondents—in fact, the large majority—were jealous of their reputations in this regard, and boldly declared that they were not and could not be made parties to this degradation. Pharmacy is proud of these, and pharmacy honors them. How far the responsibility of jobber and manufacturer extends is not yet settled; but when they know, as they must know, that they, too, are pandering to this most unfortunate, this man-destroying appetite, they must, indeed, have seared consciences to continue to supply this unwarranted demand without protest. Yet the greater responsibility, the responsibility for their sale, rests largely with registered pharmacists, who not only have control, but discretionary control. This discretion applies even to orders from physicians and their prescriptions. In no possible manner can a pharmacist be compelled to sell these drugs if he deems, with good reason, their use to be injurious to the party purchasing. The responsibility, then, becomes a sacred obligation, and the excuse so often made, "If I don't sell him, some one else will," is as cowardly as it is specious. The responsibility is upon us, and we must meet it or go down. If asked what can be done? we may answer, Our level best; that's all.

First, this Section and this Association should direct their best efforts towards the absolute suppression of the incoming of opium for smoking. If the Chinaman cannot get along without his "dope," we can get along without him. The great increase in the quantity of this special kind of opium proves one of two things, or both: Either our exclusion laws are being violated, or the smoking of opium is largely practised by others than Chinese.

Next, this Section and this Association should assist in securing State legislation upon the subject. Through the various State Associations and

to pass a uniform law carefully prepared by this Association.

Thirdly, by rule or order, all persons persistently trading in narcotics to be used by drug habitues should be excluded from pharmaceutical brotherhood, especially from this Association's membership, and should be ostracised by our profession as Law excludes the defaulter and Medicine disowns the abortionist.

For the committee,

H. P. HYNSON, *Chairman*.

Mr. Eberle resumed the chair while the report was being read.

The report was greeted with long-continued applause.

THE CHAIRMAN: Gentlemen, you have the report of your committee, with the very interesting results noted. I can state that the committee has done a great deal of work in this matter. What is your pleasure in regard to the report?

MR. MASON: Too often a committee having to deal with a matter of this kind makes a merely perfunctory report, and I think this committee should be thanked for the very valuable work that has been done. I move that the report be accepted; that the hearty thanks of this Section be extended to the special committee, and that the report be referred to the Committee on Publication.

The motion had a second in Mr. Hallberg.

MR. SEARBY: I would like to say in regard to that matter that these statistics need to have very careful inspection before we can arrive at a correct conclusion on all the points that may arise in our minds. It would appear from the large amounts of smoking-opium imported into this country that the evil has largely increased, but we do not appear to have had a corresponding increase among the Chinese of the country. In California, where I live, I suppose the smoking of opium is most largely carried on. There are a few whites who smoke opium, but I think their number is not large enough to greatly affect the statistics. Opium is imported in very irregular quantities. Every now and then there is a very large amount of opium imported and the duty paid thereon. But we are fully aware of the fact that large amounts of opium are constantly being smuggled into the country, and that the total amount consumed is larger than the statistics will tell us. In some years the amount of duty paid on opium will be much larger than in other years. But it does not follow that the consumption is greater, on account of this smuggling that I speak of. When the smoking of opium reaches a certain amount, it pays to import it and pay the duty. When, on the other hand, the consumption is not equal to the supply, it does not pay to do this.

MR. E. J. KENNEDY: I should like to see this committee continued; it is doing a good work.

MR. HALLBERG: I second the motion. The authors of this paper, although in rather an altruistic position here, are entitled to great credit for engaging in this work. This situation is important to the pharmacist, because, being brought in daily contact with these poor sufferers, he is in a position to indicate to them how they may possibly get rid of this habit, if they want to get rid of it. I want to call your attention to a paper published in the American Journal of Pharmacy—last March, I think—by Mr. Ebert, in which he gave his observations concerning opium, dating back for many years. He has discovered that narcotine—one of the alkaloids, as you know—administered in one-grain

cotine has the effect of toning-up the system, and giving the patient a sort of apathy for the drug, or at least a desire to not use morphine. Mr. Ebert has, in many cases—even the most obstinate cases—thorough degenerates—actually cured them of the morphine habit by the use of this narcotine. Now, I think this matter ought to be presented to the medical men for further investigation. Mr. Ebert desired me to mention this matter before the Section this morning. I hope, Mr. Chairman, that the committee will be continued, and will consider the suppression of these narcotics, and the education of the public for the alleviation of this evil. Incidentally, however, as to the smoking of opium, there is no particular danger from that; morphine and cocaine are the things we should go after.

MR. CHAIRMAN: The motion is, that the thanks of this Section be extended to this committee, and that its report be received and ordered printed, while the amendment is that we continue the committee.

And the motion was so put and carried.

MR. HYNSON: Mr. Chairman, I do not understand that the *personnel* of the committee is continued, but that the committee itself, as a committee, is continued. I want it distinctly understood that I cannot take up that work again next year.

MR. MASON: I move you now, Mr. Chairman, that Mr. James H. Beal, of Ohio, be requested by this Section to draft a model law to prevent the indiscriminate sale of narcotics—cocaine and morphine—and that this model law be presented by Mr. Beal at the meeting next year for action and approval, and that this model law, if satisfactory, be recommended for general adoption in the different states of the country, as recommended in the Chairman's address.

Mr. Mayo seconded the motion.

MR. HALLBERG: I oppose that, unless Mr. Beal is made a member of this committee. The committee, after thoroughly exhausting the subject, should draw such a law. I offer as an amendment that Mr. Beal be made a member of this new committee.

THE CHAIRMAN: I believe the new Chairman will appoint this new committee, so that matter will go over. Mr. Mason will please state his motion again.

MR. MASON: My motion is, that Mr. Beal be requested to draft a model anti-cocaine and morphine law.

THE CHAIRMAN: The motion is that Mr. Beal be requested to draft a model law affecting the sale of narcotics.

And the motion was so put and carried.

MR. MAYO: Merely as a point of order I want to say, that I believe there was an irregularity in the manner in which the resolutions concerning the sale or promiscuous distribution of antitoxins were adopted, and I therefore move that these resolutions be so amended as to read that the Section on Education and Legislation recommend to the General Session that it adopt these resolutions, that being the manner of procedure in matters of that kind; and also that the General Secretary be requested to communicate these resolutions to Congress, the several state legislatures, and to the municipal authorities of the principal cities of the United States, as being the sentiment of the Association. This is purely a *pro forma* suggestion.

Mr. Hallberg seconded the motion, and it prevailed.

THE CHAIRMAN: The next order of business is the nomination of officers for the ensuing year. The officers of the Section are a Chairman, a Secretary and three Associates. I will now entertain nominations for Chairman of this Section.

MR. HALLBERG: I take great pleasure in placing in nomination Mr. William C. Anderson, of Brooklyn, for the office of Chairman.

Mr. Meyer seconded the motion.

The chair stated that if there were no further nominations for Chairman at this session, nominations for Secretary would be in order.

Mr. Meyer thereupon nominated Mr. Harry B. Mason, also of Detroit, for the place of Secretary, and Mr. Hallberg seconded the motion.

The chair stated that if there were no other nominations for Secretary, nominations for that place would be closed for this session, and called for nominations for the three Associate Members of the Committee.

Mr. Mason nominated Mr. Caswell A. Mayo, of New York, and Mr. Knox nominated Mr. Ralph B. Gable, of the same city, and Mr. M. W. Bamford, of Philadelphia, for Associate Members on the Committee.

The chair stated that if there were no further nominations, this would close nominations for officers of the Section for the present, and the matter would go over to the next session.

The chair stated that the next order of business was the presentation of papers, with discussion upon the same, and explained that Mr. Beal had been unable, on account of other pressing duties, to complete his paper upon the subject, "Fifty Years of Pharmaceutical Legislation," and regretted the necessity of having to omit that.

Mr. Hallberg was then called on to read his paper on dispensing by physicians, which he presented as follows, being applauded by his audience :

DISPENSING BY PHYSICIANS.

BY C. S. N. HALLBERG, CHICAGO.

The dispensing of medicines by physicians is a delicate subject for discussion, because its consideration must invariably also introduce the prescribing by pharmacists.

Believing, however, that both are wrong in principle ; that persistence in them will prove detrimental, if not destructive, to both professions and that one wrong does not condone another, the subject should have serious consideration.

At the June 19 meeting of the North Branch of the Philadelphia County Medical Society, the question, "Should Physicians Dispense?" was presented by Dr. Harvey C. Masland, and discussed by twelve physicians—members. The answer was almost unanimously in favor of the proposition for reasons which may be summarized under the following :

ADVANTAGES OF DISPENSING BY PHYSICIANS.

1. Promptness of administration in emergencies.
2. Control by physician ; prevention of prescription repetition and indefinite self-medication.
3. Influence of homeopathic practice.
4. Convenience of tablets : cheapness, uniformity in strength, palatability and absorbability.
5. Unreliable and otherwise unsatisfactory dispensing by pharmacists.
6. Exploitation of proprietary medicines by pharmacists.
7. Superiority of machine-made over hand-made preparations.

THE PHYSICIAN'S POINT OF VIEW.

Whether or not it is ethical for a physician to dispense, or to open a drug-store, was also decided in the affirmative with some qualifications :

Dr. Cooper was of the opinion that the scientific status would be advanced by the discontinuance of dispensing and the discountenancing of proprietary medicines.

Dr. Mills admitted that it would increase commercialism, but saw no reason why a physician should not invest his money in any way he desired either by dispensing or opening a drug-store.

Dr. Hirsch feared the deleterious effects of the physician falling into a rut, prescribing a set formula for every case, and deplored the lack of study of materia medica.

Dr. Gerhard also found the greatest objection to be the liability of practitioners to fall into the habit of making the symptoms fit the remedy, rather than fitting the medicine to the disease.

Dr. Buckby did not think it was unethical to dispense, but he believed that better results were derived from liquid preparations than from tablets.

Dr. Masland added that he preferred solutions made from tablets of KI, KBr, etc., than from the salts.

These physicians certainly present a strong side of their case, and incidentally a serious indictment against the pharmacists, and this in Philadelphia—the cradle of American pharmacy.

THE PHARMACIST'S POINT OF VIEW.

Let these various points, however, be taken up and considered *seriatim*. The first three propositions may generally be conceded.

Emergencies : There cannot be any objection to physicians dispensing remedies in emergency cases. This has always been the custom, but should be strictly confined to the resources of the pocket-case.

Prescription repetition : There is no doubt that the promiscuous repeating of prescriptions by pharmacists is the most fruitful cause for physicians dispensing. There is no need of argument on this point. The physician-prescriber alone controls the prescription, the pharmacist is its custodian

for his own protection and the prescriber's reference ; the patient has no right in it except as ordered by the physician. All physicians should use blanks containing an order prohibiting repetition except upon re-order. Pharmacists should take the initiative in this and always refuse refilling prescriptions containing habit-forming agents.

Tablets.—The advent of the tablet made the dispensing by physicians what it is at the present time, or rather what it was some years ago, since many have realized the fallacy and inadequacy of the tablet-form for general medication, much to their regret.

The fallacy of the compressed tablets as a substitute for pills has been sufficiently exposed. Except as a convenient dosage-form for the extemporaneous preparation of solutions for hypodermic injections, etc., it is a travesty on pharmacy. The tablet-triturate, on the other hand, is an exceedingly convenient and reliable dosage-form of dry medication for triturations. There is a serious aspect to the tablet, however, which should alone be sufficient to condemn its use. While a pill is not likely to be taken for, or confused with, candy or lozenges, tablets are. Scarcely a week passes but some fatality is reported from the improper use of tablets. Sometimes they are given wilfully with homicidal intent, again "eaten" by children, when left somewhere carelessly or accidentally.

Nor is this the greatest objection to the tablet. Recently there have appeared tablets "for dispensing purposes," each containing quantities of powerful alkaloids far exceeding the maximum doses. Such tablets have been confused with ordinary dosage-tablets and administered with fatal results. Only the last week in August there were three mysterious deaths at the Presbyterian Hospital in Chicago, supposed to be due to poisoning. A nurse confessed that she administered to a patient two one-grain tablets of strychnine on the assumption that they were $\frac{1}{80}$ grain each. Cases like these are of frequent occurrence. Physicians in dispensing tablets to their patients usually wrap the tablets in a piece of paper without any directions or other data. Women have been found dead and upon examination with tablets in their possession ; the verdict of the coroner's jury being death from heart disease ! What may be the inference ? The story of Jane Toppan, who confessed to killing thirty-one persons with morphine and atropine, is too recent to dwell upon. Where did this modern Tofana, masquerading as a nurse, get such quantities of these poisons ?

The tablet is too innocent-appearing a morsel to be used as a vehicle for deadly poison ; it is entirely too convenient for physician's dispensing, and it is not, by virtue of its method of manufacture, more uniform and reliable than liquid preparations or dosage-forms like powders, capsules, cachets or pills made by the hands of pharmacists.

In the charged incompetency of pharmacists there is some truth ; it is believed, however, there is also incompetency among physicians, judging from the character of the prescriptions written by many. On the question of proprietary medicines many pharmacists would plead guilty, but how about the physician? Does he not patronize proprietary medicines, often of secret composition, in preference to the preparations of the Pharmacopœia and the National Formulary? Who is responsible for the vast number and variety of medicines used for self-medication by the laity on the strength of the endorsement of medical men?

THE ETHICAL CONSIDERATIONS.

With possibly one exception, all the physicians above referred to expressed the opinion that there was no ethical objection to a physician dispensing his own medicines, or opening a drug store.

To open a drug store and place it in charge of a competent pharmacist, as the law requires, is perhaps open to no serious objection ; but to the dispensing, by a physician, of his own medicines, there are professional, ethical and moral objections which should have prompt consideration.

In the continental countries of Europe, where matters medical have crystallized into a system more than here or in the United Kingdom, dispensing by the physician, as well as prescribing by the pharmacist, are not permitted. It was the experience of the seventeenth and eighteenth centuries—the era of poisoners—like Tofana in Italy, which caused the governments to recognize that the prescribing and dispensing of medicines should be separated, and this led to the segregation of pharmacy as an independent practice from that of medicine.

This separation is based upon the principle that it is not sufficient protection to the public, nor in accord with public policy ; that it is not safe or proper to concentrate in the hands of one single person, no matter how competent, the tremendous responsibility of diagnosing the disease, prescribing the remedy, to prepare or administer it, and then, if required, to sign the death certificate.

AN APPEAL.

It is admitted that the physicians have grievances in the incompetency and carelessness of many druggists and in their unwarrantable assumption to diagnose and prescribe, and the tendency to foster the patent-medicine evil, but these are things which time and education should remedy. The pharmacist needs the support and encouragement of the physicians, to improve his art and practice and advance his profession. The physicians will continue to find the educated, experienced and conscientious pharmacists of the greatest service to them, as they have been in the past. Their work is much along the same lines, and they should work together. The

restricted, mountebanks and charlatans are permitted even under the aegis of the government—the copyright laws—to exploit every kind of deleterious and poisonous concoction. Although the practice of pharmacy is now regulated by law in every State in the Union, the patent-medicine man and his satellite, the venal newspaper, are above all law, moral or divine. This paralyzes the efforts of the pharmacists to elevate themselves, and is largely responsible for the conditions complained of by the physicians.

The new era of medical organization will be powerful in legislative affairs. Will the physicians restrict the patent-medicine evil and thus correct the untoward conditions in pharmacy? Or, shall the pendulum be allowed to swing backward and every physician be again his own apothecary?

THE CHAIRMAN: Gentlemen, you have heard the interesting paper of Mr. Hallberg. Are there any remarks?

MR. BURKE: Mr. Chairman, one part of the paper of Mr. Hallberg refers to the refilling of prescriptions. In respect to that, I would like to call attention to a little notice we attach to every prescription that goes out of our place, and that is this: "Much harm often results from refilling prescriptions. It is always best to obtain the advice of your physician." We have had this in use for several years, and it has always met the approval of the physicians, and we have never lost a customer. We have found it to be a good thing.

MR. WILBERT: I did not know any retail pharmacist had the courage to do that. I am really gratified to hear it. One great trouble is in refilling prescriptions without the physician's order, and I am glad to hear that somebody has had the courage to take this course. I think resolutions should be passed here, so as to further progress along these brave lines. I think if the druggists of the country would make some united effort to discontinue or discountenance the refilling of prescriptions, they would encourage the physicians to send prescriptions to their stores, and discourage accordingly the prevailing practice of dispensing by physicians. One of the arguments the physicians offer for dispensing drugs themselves is, that if they write a prescription for a patient he goes to the drug store and has it refilled, and never comes back to the doctor: the druggist gets the money and the doctor gets none. If the druggist would stand by the doctor, I am sure the average physician would stand by the druggist.

MR. MAYO: To carry out Mr. Wilbert's idea I would suggest the passage of a resolution here to the effect that it is—

Resolved, By the Section on Education and Legislation of the American Pharmaceutical Association that the refilling of prescriptions be systematically discouraged by pharmacists.

I think that is the idea suggested by Mr. Hallberg and Mr. Wilbert.

This motion was seconded by Mr. Helfman.

THE CHAIRMAN: It is not necessary to take a vote on the reception of the paper. Without objection it will be referred for printing.

MR. SEARBY: The suggestion offered by Mr. Burke is a most excellent one, and I have no doubt will be very generally adopted in the cities where the percentage basis does not prevail. But in our State—California—we are handicapped by the fact that almost every physician whose business is worth anything receives a percentage on his prescriptions, or has it offered to him, and the commission ranges from 50 to 75 per cent. The argument by which this pernicious system prevails is this: The pharmacist, pays the doctor a commission on his first prescription, but nothing on renewals. Now, if the pharmacist, who is generally believed by the public to pay a commission on every prescription, tries to send the patient back to the doctor, the intimation is that the pharmacist and the doctor are in collusion: the doctor makes the patient go the druggist, and the druggist sends him back to the doctor; and where is the poor patient? The remarkable thing is, that the public with their eyes wide open, patronize the percentage druggists and doctors. To show you how this thing works, a warm personal friend of mine who would have loaned me a thousand dollars if I had asked him, fell into the hands of one of these percentage doctors, who sent him to one of these druggists who was credited with paying 75 per cent. commission whenever it was demanded and in explanation of his action in not coming to me he said one day, "You know I have changed my doctor now, and I have to take my prescriptions to the other fellow. If I take my prescription to the store the doctor tells me to, and I don't get well, I blame the doctor; but if I take it to your store, I can't do that." That is the case with hundreds of people in the city of San Francisco.

Another thing in regard to Mr. Burke's suggestion: Medical fees in San Francisco are higher than any place in the United States, possibly. The customary fee for family visits is \$3, and many charge \$5; and some have a sign up in their offices, "Office fees, \$5." Many of them get \$5, and yet the patients do not open their mouths. The regular office fee is not so large, of course—the usual fee is \$1.50 or \$2 for that class of practice.

For over thirty years I have been as constantly watchful of the interest of the physician—and the patient—as possible, and I have been careful not to refill prescriptions unnecessarily, and have frequently refused to do so even when the prescription was a very old one, and sometimes have gotten into an unpleasant controversy with the patient because I would not do so. He thinks you have no right to refuse him; that it is his prescription, and he wants it filled again. It is a hard thing to deal with in my part of the country, under the conditions prevailing there.

MR. HELFMAN: I would like to ask Mr. Hallberg what his observation and experience are on one or two points: Has the habit of dispensing by the doctors been increasing or dwindling, or has it remained stationary, in the past few years? Has the consumption of tablets increased or decreased? Of course, I have my own opinion on these points, and a very decided one, but I would like to know Mr. Hallberg's views.

MR. HALLBERG: As far as the pharmacists are concerned, dispensing by physicians is decreasing, and the use of tablets is also on the decrease. But there are several mail-order organs that are exploiting the physicians all over the country—especially in the smaller towns—and through these channels a great deal of what was formerly prescription work is diverted, and these remedies are dispensed by physicians; and medicines, also, that were formerly bought from the regular manufacturers, or even from the retail manufacturers, the druggists, are now obtained through these mail-order organs—through that channel. I am surprised and mortified, as an American citizen, that I should be paying my share towards enabling one or two, at least, of these journals to send out their issues through the post-office department, under pound rates, in the face of a big deficit every year in that arm of the Government service. It is these fellows who are making the deficit in the post-office department. Without them, we should be able to send a letter anywhere for one cent, instead of paying two. If I were a retail pharmacist, I would not rest until these fellows were driven out of the second-class rates of the postal

service. It is an outrage that they should be sending 50,000 or 100,000 copies of these monthly issues to every physician in the United States, just to exploit the tablets and the salts that always go with them. Four ounces of magnesium sulphate for one dollar! [Applause.]

THE CHAIRMAN: Gentlemen, Mr. F. C. Henry is here, from Washington, relative to the establishment of a department of pharmacy in the Carnegie Institute, and without objection we will hear from him at this time.

MR. HENRY: I only want to say a few words. We think the establishment of this department in the Carnegie Institute is a very important matter, and should come up through the American Pharmaceutical Association. The idea is to establish a chair or committee of research in pharmacy in the Carnegie Institute at Washington. The National College of Pharmacy at Washington conceived that idea some time ago and sent out letters over the country and received many favorable replies, assuring them of co-operation. What we would like to do now is to have the Association take the matter in hand and endorse the project and co-operate with the various colleges to secure this chair of pharmacy. I have not prepared any resolution, but I think the Association should take some action in this matter.

MR. MAYO: I am very sorry Mr. Henry has not prepared a resolution to offer here. He has given the matter some thought, apparently. Individually, I corresponded with some members interested in the subject, but received very little encouragement. I am confident that if this Section were to take up the matter and prepare suitable resolutions, and enter into communication with the authorities of the institution, there would be a much better chance of getting that recognition of pharmacy which it deserves at the hands of such an institution on as great a scale as the Carnegie. I, therefore, move the appointment of a committee to prepare and submit their views on this subject at the next session of this Section. It is a very important matter, and I believe it requires some thought.

MR. HENRY: This matter is to be brought before the attention of the committee of the trustees of the Carnegie Institute at the meeting in November. From what we can learn they are already very much in favor of it.

MR. MAYO: I move that a committee of three be appointed to formulate resolutions on the subject and submit them at the subsequent session of this Section.

Mr. Rapelye seconded the motion, and it was put and carried, and the chair appointed Messrs. Mayo, Henry and Scoville on the committee.

On motion of Mr. Searby, duly seconded, the Section then adjourned to meet again on Monday morning.

SECOND SESSION—MONDAY MORNING, SEPT. 15, 1902.

The second session of the Section on Education and Legislation was called to order in the convention hall of the Hotel Walton on Monday morning at 10:45 o'clock, with Chairman Eberle presiding. Mr. M. I. Wilbert, in the absence of Secretary Knox, performed the duties of that office.

The chair announced that the first order of business was the reading of

The next order being the election of officers of the Section for the ensuing year, the chair called for further nominations for Chairman, saying that the name of M. W. C. Anderson was in nomination for that office.

Mr. Koch, of Pittsburg, nominated Mr. J. W. T. Knox, of Detroit, for Chairman, and the chair stated that if there were no further nominations he would declare them closed for that office, and the election of a Chairman would be proceeded with. The chair then called on Mr. Jones, of South Dakota, and Mr. Lindval, of Illinois, to act as tellers and take the vote, and they performed that duty. The result of the vote as announced by Mr. Jones showed that 49 votes had been cast, of which Mr. Knox received 27 and Mr. Anderson 22. Thereupon Mr. Anderson moved to make the election of Mr. Knox unanimous, which motion was seconded by Mr. Beringer and carried, and the chair declared Mr. Knox duly elected Chairman for the ensuing year.

Further nominations for Secretary were invited but none were made, and on motion of Mr. Lowe, seconded by Mr. Stevens, the acting Secretary, Mr. Wilbert, was directed to cast the affirmative ballot of the Section for Mr. Harry B. Mason for Secretary. Mr. Wilbert announced that he had cast the ballot as directed, and the chair declared Mr. Mason unanimously elected.

The chair then called for further nominations for Associate Members of the Committee, Mr. Caswell A. Mayo, Mr. Ralph B. Gable and Mr. M. W. Bamford being already in nomination. There were no further nominations, and Mr. Lowe made the same motion as for Mr. Mason as Secretary, which was duly seconded and carried. The acting Secretary announced that he had cast the ballot of the Section for these gentlemen as directed, and the chair declared them duly elected Associate Members for the coming year.

The Chairman then called for reports of committees.

MR. MAYO: As Chairman of the Special Committee appointed at the last session to draft resolutions concerning the matter of the establishment of a Committee of Pharmaceutical Research in the Carnegie Institute, I will say, that after conferring with Mr. Henry, who informed us that he had been in communication with the Carnegie Institute people with reference to the establishment of a pharmaceutical department, your Committee drew up and beg now to submit the following resolutions covering this matter:

WHEREAS, Pharmacy in its higher branches is confronted with many grave problems which can only be solved by original research conducted along broad lines, and involving labors so great as to be wholly outside the possibility of individual performance under ordinary conditions; and,

Whereas, The solution of these scientific problems is fraught with immense possibilities of good to the human race in the discovery of new drugs and the simplification of our materia medica and its more complete comprehension; and,

Whereas, According to the articles of incorporation, the objects of the Carnegie Institute are—

“(a) To conduct, endow, and assist investigation in any department of science, literature, or art, and to this end to co-operate with governments, universities, colleges, technical schools, learned societies, and individuals:

"(b) To appoint committees of experts to direct special lines of research;

"(c) To publish and distribute documents;" therefore, be it

Resolved, That the American Pharmaceutical Association hereby petitions the Board of Trustees of the Carnegie Institution to establish an Advisory Committee on Pharmaceutical Research, with a view to promoting original research in pharmaceutical science, etc., etc.; and be it

Resolved, That the President of the American Pharmaceutical Association be instructed to appoint a committee of twenty-five members, which committee shall be charged with the duty of laying the above resolutions before the Carnegie Institution, together with suggestions as to how the work of this Advisory Committee be conducted and made most effective.

MR. MAYO: I may say that the committee had in view, in the first place, that this is a movement to procure recognition of our branch of science, which has heretofore been rather neglected in the matter of endowments. The object in suggesting a membership committee was, to insure the active co-operation and counsel of all the various institutions of learning, and have the plan laid before the institution in such manner as to prove to the trustees that it represented the consensus of opinion of the American Pharmaceutical Association at large. Since the annual meeting of the Board of Trustees comes in November, we shall have to trust to a committee, of course, to do the right thing in this matter. I move that the Section recommend to the General Session the adoption of these resolutions.

The chair put the vote on the resolutions presented, and they were adopted accordingly.

The report of the Committee on Chairman's Address was called for.

MR. MASON: Mr. Chairman, Saturday your address as Chairman was referred to a committee of three, the Chairman of which was Mr. Kauffman, the other two members being Mr. Ebert and myself. I was unable to find the other members of the committee, and hastily this morning, since I have been sitting at the table, I have taken the liberty of writing a report, and Mr. Ebert has expressed his approval of it.

MR. CHAIRMAN: That being a majority of the committee, there will be no objection to the presentation of the report.

Mr. Mason read the report as follows:

We commend the comprehensive statement which the address contains, of the educational and legislative problems now facing the profession; and we believe that the address will be consulted years hence for the accurate picture which it presents of conditions as they exist to-day.

We especially commend the stand which the chairman takes in declaring that a high school education should be demanded of all students entering colleges of pharmacy, and that graduation in pharmacy should be demanded of all applicants presenting themselves before State Boards for examination and registration as practicing pharmacists. We believe furthermore, that this Association should place itself firmly on record as declaring that these steps should be taken at the earliest possible moment; and we recommend that we do so on this occasion.

ALBERT E. EBERT,
HENRY B. MASON.

Mr. Anderson, seconded by Mr. Kebler, moved to adopt the report. Carried.

Mr. M. I. Wilbert then offered the following resolution, saying he hoped the Section would take action thereon at once, so that it might be presented to the general session this afternoon for final action:

To further endorse the repeated action of the American Pharmaceutical Association, in connection with the adoption and use of the metric system of weights and measures in the U. S. P.,

Resolved, That the "Section on Education and Legislation" recommend that the Association in future request, that where possible, all original papers brought before any of the Sections of the American Pharmaceutical Association for discussion and subsequent publication, give formulas, doses, and the results of scientific investigations in the metric system of weights and measures.

MR. WILBERT: This is not obligatory, but simply a request that writers bear this in mind, and present their communications in the metric system.

The motion to adopt the resolution was seconded by Mr. Stevens and carried.

MR. GOOD: It might not be out of place in this connection to call the attention of the Section to a fact that is not generally known, I take it, showing the change of heart, so to speak, and the progress made by this Association in the past fifty years. Some forty-eight years ago a resolution was brought before the American Pharmaceutical Association in which a system of decimals, taking the pound as a standard, pounds, ounces, etc., was used, and in which it was stated by the committee of the Association that the French metric system could never be adopted, because it was unsuited to American conditions. To-day we are advocating that system.

MR. LYONS: The American Medical Association adopted some years ago a resolution to the same effect as this.

MR. HALLBERG: I understand this is an appeal to the American Pharmaceutical Association to use nothing but the metric system in its printed report. That has been the case for the last five or ten years. No formula appears in these proceedings except in the metric system. I would like to amend that this be an appeal to the American pharmaceutical journals, to ignore the customary measures and translate all formulas into the nearest metrical equivalent. That would do some good. This resolution might have been proper ten years ago, and I have no objection to emphasizing the matter now, but I would like to amend this so as to ask that the pharmaceutical journals employ the metric system. Perhaps it may be well to say wherever and whenever practicable.

The motion was seconded by Mr. Hancock.

MR. WILBERT: My idea in bringing this matter before the Section was, to purge our proceedings on the floor, as far as possible, from the expressions "grains," "drams," etc., because these expressions as used here are reported in the pharmaceutical press and the medical press, and the medical profession meet us with the argument, "Your people don't use the metric system—why should we use it? They use pounds, grains, etc.—why should not we do so?" For this reason I should like to see the proceedings here in the meetings purged of these terms as far as possible.

THE CHAIRMAN: The vote is first upon the amendment to the resolution offered by Mr. Wilbert. Mr. Hallberg's motion was to amend the resolution by requesting the pharmaceutical journals to use the metric system as far as practicable. Do you accept that amendment, Mr. Wilbert?

MR. WILBERT: Yes, sir.

The resolution was then adopted as amended.

MR. WILBERT: Now, another matter: A great deal of time is lost in the way we handle our papers here. There have been perhaps a hundred papers presented in the six Section meetings. It is impossible to present one hundred papers in full in the length of time allowed us, and many of these papers must be read by title only. They are not accessible to us for several months after the meeting is over. My idea is to have every writer present an abstract of his paper at these sessions. Therefore, I move the adoption of the following resolution:

To facilitate the transaction of Section work, and promote the distribution of full and reliable reports of the papers presented before the Sections of this Association, be it

Resolved, That the Section on Education and Legislation recommend that the Association take favorable action on the first suggestion of the President's address, and that in future all writers of papers be requested to present a written abstract or resumé of the essential points contained in their respective communications. Such abstract to be used for distribution and for the consideration of the executive officers of the Section to which it is to be referred, and for subsequent use among members of the Pharmaceutical Press.

THE CHAIRMAN: You have heard the resolution, gentlemen. Is there a second to it?

MR. LYONS: I second the motion to adopt.

MR. WILBERT: There are two objects to be accomplished in having a full and complete abstract made by the writer of the paper. In the first place, the paper may be referred to the wrong Section; but if the writer makes an abstract and gives it to the officers of the Section, then they can decide whether the paper should go to that Section or another. In the second place, all the papers would be accurately reported in the pharmaceutical press. I do not mean to say they are not fairly and accurately reported now, as a rule; but some are not presented, and some not quite as accurately as the author intends.

MR. LYONS: I should like it to be *required* that every writer of a paper presented before the Association should accompany the paper with an abstract, which should be forwarded in ample time, so that the program could be prepared and printed. That is done with admirable effect in the meetings of the American Medical Association. I offer that as an amendment.

MR. WILBERT: Under present conditions many of our papers do not come in until the meeting takes place. My idea is, whether the paper has been presented or not, the writer knows what he is going to write about, and at a certain definite time there should be placed in the hands of the officers of the Section an abstract of the particular points of the paper he proposes to send in.

MR. LYONS: That is my point. My motion *requires* that the abstract be in the hands of the Committee a certain number of days in advance of the meeting.

MR. WILBERT: I accept that amendment.

THE CHAIRMAN: The mover of the resolution accepts the amendment that the writer be required to furnish the Section with an abstract.

MR. RYAN: It does seem to me that anybody who has ever acted as Chairman of a Section in this Association will realize at once that if you make that a requirement you are going to have a lot of papers left out. I think the way the other resolution was worded, where possible or practicable, is the proper way to put it. Suppose a man comes here the last day, with no idea of writing a paper, but a certain subject comes up on which he is well-informed, would you shut him off from presenting his views on the subject? The resolution is desirable in spirit, but do not make it absolutely obligatory

to have a printed abstract before the meeting. Say wherever practicable, and encourage the contribution of papers, not discourage them.

MR. HALLBERG: I favor the amendment of Mr. Lyons, for the reason that this requirement has to be obligatory to be effective. This rule has proved decidedly effective in the American Medical Association. Unless it is a requirement and made obligatory, then the vast majority of writers will not adhere to it. By making it obligatory it does not bar out, necessarily, any paper presented to the Association without such abstract, for by vote of the Section it can be received and read. That is the way it works in the twelve sections of the American Medical Association. But unless it is understood that this is a requirement it will not be effective, because we have endeavored for the last ten years in these Sections to have contributors send abstracts, and they have not done so. One reason for this, I think, lies in the fact that they do not realize with what ease an abstract can be made. For example, I keep abstracts of a number of papers in the Medical Association by simply making use of the headlines; the different paragraphs have headlines, and by using these I get a very creditable abstract of the paper. I offer this as a suggestion.

MR. RYAN: I withdraw my remarks if it is understood a paper may be admitted by a vote of the Section.

The resolution as amended by Mr. Lyons was then adopted.

THE CHAIRMAN: If there are no further resolutions or reports of committees, we will proceed to the reading of papers.

Mr. Mason was called upon, and read his paper on "Kicking Against the Pricks," calling forth the applause of his audience.

KICKING AGAINST THE PRICKS.

BY HARRY B. MASON.

The small dealer of every kind, including the druggist, has always been hostile to the department store. Ever since this modern development in commerce appeared it has been fought tooth and nail. Abuse of every sort has been heaped upon it. It has been branded with the stigma of octopus. It has been pictured as a demon seeking whom it could devour. Attempt after attempt has been made to legislate it out of existence. Bill after bill, both in this country and in Germany, has been passed after fanatical agitation. Zealots have made it a part of their religion never to step foot inside a department store—never to countenance by example the operations of a ruthless creature leaving a trail of injury ever in its wake.

But despite all this the department store is still with us—nay, it still continues to grow in size and increase in number; and for a very good reason. It is the creature, not of circumstance, not of the law or will of man, but of the law of nature. It is in complete harmony with the unfolding of progress in the commercial and industrial worlds. More, it is demanded by the stern requirement of necessity, and has appeared in compliance with that requirement.

Darwin made clear how it is that higher and higher levels of perfection have ever been reached in the animal world. The struggle for existence has always been so fierce that only the best-equipped individuals could survive; these individuals have passed their superiorities along to the next generation; this generation has in turn experienced the same struggle, undergone the same survival only of the fittest; and thus sheer necessity has continuously brought about a greater and still greater degree of efficiency—thus higher and higher types have constantly been evolved. This is the law of “natural selection;” and it is a law which is universal in its operation. It exercises its powerful and ceaseless influence upon man as well as upon the animal, and upon the institutions of man as well as upon man himself.

It is in response to this law that industrial and commercial structures have always ascended to higher and higher planes of efficiency. The struggle for existence is such that only those institutions survive—only those are “selected”—which do their work best: all others, incapable of continuing the competition, are “rejected” and fall by the wayside. There is a ceaseless demand, a never-ending necessity, for greater and greater efficiency in order that existence may not be sacrificed; and so it is that the crude structures of one generation or century give way gradually and slowly to the better-equipped ones of the next.

The factory succeeded the small shop because it greatly increased the power of production, and the small shop was eliminated—“rejected”—because it could not continue the competition. The trust is now in turn succeeding the independent factory because it is still further increasing the power of production, and the independent factory is suffering the fate which it meted out formerly to the small shop. The department store appeared, and is growing in size and power, because it is much better equipped to meet the stern requirements of necessity than the small store. It prevents in considerable measure the economic wastes inevitable in a number of separately-conducted stores; it makes possible a greater degree of organization; it develops a higher type of executive ability; and in a number of ways it becomes much more efficient in the struggle for existence.

It is apparent, then, that nothing can stop the development of the department store. It is born of necessity. It is the child of progress. It is protected and nurtured by the great laws which hold mankind in their grasp so firmly that there is no possible escape. And it is bound to endure until some more perfect structure arises in competition and wrests from it the victory of struggle. Understanding all this, grasping its significance, how futile and how unwise is seen to be the effort of the small dealer to abolish the department store! As well might one hope to stay the rising tide, or to turn back the mighty river upon its course!

I am aware that all this sounds very cold and calloused, and I hasten to declare that I have always felt, and now feel, a great sympathy for the

small dealer, and of course more particularly for the druggist. The druggist has suffered grievously at the hands of the department store. More than half his business in toilet goods and sundries has been taken away from him, and the percentage of profit in the portion left has been cut nearly in two. This has been enough in itself, but of more recent years his business in drugs, and even his purely professional work in prescription-compounding, have been ruthlessly encroached upon, until it has often seemed as if nothing would in time be left to him. Small cause for wonder is it that the druggist, goaded first on this side and then on that, has turned on the department store with anger in his eye, a fierce hatred in his heart, and a burning desire within him to rid the earth of his merciless assailant !

And yet, unwholesome though the thought is, we must recognize here the penalty of progress. No higher step in economic evolution is ever reached but some cruel harm is done. It will not now be gainsaid by any one familiar with industrial conditions that the machine and the factory, since their introduction in England a century ago, have been of enormous benefit to society, increasing the wages and salaries of the workers and executives on the one hand, and on the other greatly reducing the cost of the goods which they consume. Indeed, scarcely any single industrial change has ever been so decidedly to the advantage of society as that ushered in by the machine ; and yet the machine threw thousands of men out of work at one stroke ; it brought these men to the verge of starvation and despair ; it bred in them a spirit of savage hatred and revolt ; and the machine-breaking riots in England are among the most bloody scenes in all the pages of industrial history.

Two years ago it was reported that the trust, in its rapid development during the previous three years, had brought about the loss of position to thirty thousand traveling salesmen. These men were of a higher order of intelligence than the handicraftsmen thrown out of work by the machine ; they had less difficulty in adapting themselves to their changed environment ; and so the public at large has heard less of the fate of the commercial travelers than was the case a century ago with the mechanics and laboring men. But the travelers were nevertheless very bitter. They met in national council, made severe complaint of their fate, and declared in no mild terms that the trust was a cruel monster which should be wiped off the face of the earth sternly and without remorse. They desired the extinction of the trust no less devoutly than the handicraftsmen had desired that of the machine or the small dealers that of the department store.

The readjustment which follows industrial or commercial changes is ever painful. Somebody is always hurt, somebody cruelly and ruthlessly crushed, and it is a saddening thought that it is by these very injuries that society benefits. A real economy was made when the machine threw thousands of men out of employment ; it was no less an economy when the trust dispensed with the services of the commercial travelers, and when

the department store compelled the small dealer to lower the price of goods. Every time a handicraftsman or traveler lost his position; every time a small dealer was compelled to reduce his profit on an article, or perhaps to sell the article at a loss, society gained that much. The few were hurt in order that the many might be benefited. This is cruel. It is sad to contemplate. But it is nature's way; it is inevitable; and there is no escape from it—positively none.

The department store represents a higher step in the evolution of commerce; it is the result of natural "selection;" it is more efficient than the small store—more capable of succeeding in the struggle for existence; and it will continue to grow and develop despite all efforts to abolish it, and absolutely regardless of the classes or individuals whom it treads under foot in its progress onward and upward. To cry out against this fate is worse than useless. To attempt its prevention is merely to kick against the pricks, or, Don Quixote-like, to tilt one's lance against a windmill. The lesson of evolutionary science is to waste no time in reactionary efforts which can avail nothing, to spend no energy in foolish attempts to turn the river back upon its course, but to realize that the conditions have changed irrevocably, and that we must adapt ourselves to them if we are not to perish from the earth. In biology the species of animals which have successfully adapted themselves to their changing environments have continued to exist; those which have not so adapted themselves have suffered the fate of extinction. The same alternative presents itself to the small dealer. If he succeeds in lifting himself to the economic plane of the department store he will be in position to continue the struggle for existence on equal terms. If he does not so succeed, his lot is bound in the very nature of things to grow worse and worse with each passing decade.

Fortunately, so far as the druggist is concerned, the process of adaptation to environment is beginning to take place, and the outlook is promising. I firmly believe, and have previously declared before this body, that an era of co-operation and combination in pharmacy is slowly appearing; and in a paper read a month ago before the Michigan Pharmaceutical Association I reported the numerous evidences of such a movement which have manifested themselves during the past year. This development is in line with economic progress. It will equip the druggist with powers equal to those of the department store. When the drug business is done on a larger scale; when the economic wastes of the present order have in considerable measure been prevented, and the percentage-expense of doing business has been decreased; when greater executive ability has been developed and placed at the helm; when, in short, greater economic efficiency has been gained, the druggist will be in position to compete with the department store on equal terms. He will then have adapted himself to the changed environment, and will have placed himself in harmony with the laws of progress instead of in blind opposition to them.

This adaptation will not be accomplished quickly. Its consummation must wait upon a fuller development of the co-operative spirit. Its attainment must necessarily be a matter of slow and natural growth. But a long step in the process will have been taken when it is once thoroughly realized that adaptation is necessary. When we have come to know perfectly that to kick against the pricks is not only useless, but is wasteful of time and energy that should be husbanded and used to better advantage; and when we have been brought to realize that we must keep pace with changing conditions if we are to succeed in the struggle for existence, the battle will already be half won. To bring ourselves to this realization is then our first duty; and the rest shall follow in due time.

Mr. Burke moved to accept the paper and refer for publication. Carried.

THE CHAIRMAN: We have a paper by Mr. Searby, who wishes to leave this morning, and I have asked him to give an abstract of his paper and he has consented to do so. If there is no objection, we will hear from him now.

Mr. Searby then presented in abstract the following paper on college-entrance requirements, receiving the applause of the members:

SHOULD COLLEGES OF PHARMACY DEMAND HIGH-SCHOOL GRADUATION OR ITS EQUIVALENT AS A CONDITION FOR ENTRANCE?

BY W. M. SEARBY, SAN FRANCISCO.

Colleges of pharmacy exist primarily for the benefit of students, secondarily for the public welfare, and incidentally for the benefit of teachers and officers. Are we sure that the last is not sometimes put first, and the first last? For the purpose of this discussion, I shall assume that we are all supremely desirous of devising what is best for the students. This may involve the necessity of regarding the financial part of the question as a secondary matter, if not of ignoring it altogether. But of this I will speak later.

Assuming, then, that our first consideration is to so conduct our colleges that they shall be of the greatest possible service to the students, what should be our action with regard to preliminary education?

There are two views held on this point. One, that we should do the greatest good to the greatest number, and, therefore, should admit all applicants, irrespective of their general educational qualifications; the other, that we should follow a somewhat eclectic course by confining our instruction to those who present certain evidences of their fitness to profit adequately by such instruction. Which of these two modes of procedure will in the long run produce the best results to the students?

There is much to be said on both sides. Our sympathies naturally go toward those with the least advantages—with the under dog in the fight.

his own living, and perhaps to assist in the support of the family, and who, because of this necessity, had to leave school at an early age, and is therefore handicapped in the race with his more fortunate competitors, always has our sympathy. Not a few of this class begin their course in drug stores as errand-boys, and after a few years of faithful work adapt themselves to the general work of the store. It is quite natural that such youths should wish to follow the drug business, and in due time become ambitious to enter a college of pharmacy. Should they be accepted with their limited schooling, or should they be debarred from the privileges of a college until they have made up their deficiencies in general education?

By admitting all such applicants, and doing the best we can for them, we accomplish two desirable objects. First, we secure a larger number of students, and thereby increase the revenues of our colleges, by this means placing ourselves in a position to secure the most effective equipment and the best teachers; at the same time, having more students, we bring the benefits of the college to a larger number. It would seem at first sight as if this must be the better plan; for by raising the entrance requirements we reduce the number of students and the revenues of the college at the same time. I am assuming that colleges are dependent upon the tuition fees for their income. While this is not the case with all, it is so with such a large proportion that I think it best to consider this aspect of the question as a part of it.

It would seem as if, under the conditions we are considering, all young men in drug stores would avail themselves of the opportunity of attending college, if there were no educational bars to shut them out; but the facts prove otherwise. For three-quarters of a century there have been colleges of pharmacy to which admission was practically free from educational barriers, and yet a very large percentage of these young people have never been to college. Doubtless the difficulty of obtaining the necessary money for tuition has kept some back, but that cannot be the main reason. In some of our university schools of pharmacy tuition is practically free, and yet the number of students in those schools is smaller than in others where tuition has to be paid for. Even after we have made allowance for the educational requirements demanded by such schools, we are forced to the conclusion that some other cause is operating to keep them away. In view of the condition already noticed, I can account for the limited attendance only by supposing that most of those who remain outside of the colleges do so because of indifference; either they do not know the value of the instruction they would receive, or they are in the drug business as a matter of trade, for which scientific attainments have in their minds so little value that they are not regarded as essential.

Going back now to the question whether all should be admitted whether they have educational qualifications or not, we have practically to decide

in the negative, if indeed the question has not already been so settled ; because we find* all of our colleges committed to the principle of having some preliminary education, inasmuch as all require that matriculants must have a grammar-school diploma or its equivalent. Should we be satisfied with that, or should we demand more ?

If we inquire why a grammar-school diploma is demanded, we are told that the young person who has had less educational training than a grammar-school diploma indicates is not likely to make a good student. His progress is not likely to be satisfactory either to himself or to his teachers. Experience has shown this to be the case. It may be that he left school before completing the grammar-school course because he was restless or disinclined to study or chafed under school discipline. It may be that he was so lacking in general intelligence that his friends considered it useless to keep him longer at school. If he left for any of these reasons it is almost certain that he would be an undesirable student, and that the expenditure by himself or his friends of money for college fees would not be a profitable investment. There only remains one other reason that we can imagine that might have taken him away from school so early,—namely, the necessity of going to work to earn money. We all know that such cases, though not common, do sometimes occur. But I think we are all prepared to admit that even such persons, if really anxious to go to a college of pharmacy, will find some means of overcoming their early disadvantages, so as to obtain at least a grammar-school education. And if the necessity should be found to exist for carrying on this preliminary work still farther, could not the same persons be induced to meet this condition, if it should be for their ultimate gain ?

It seems, therefore, that the only question for us to consider is whether we should not go a step farther and demand that our matriculants shall have something more than a grammar-school education. If we exclude all who have had less culture than this on the ground that their mental training is so limited that they are not likely to make satisfactory progress as pharmacy students, is it necessary or desirable that we should set our standard of general education higher for the same reason ? And if we should make such a demand, what should be the minimum requirement ?

Speaking from experience, I am prepared to advocate that we should, within a few years, not more than four at the outside, demand high-school graduation or its equivalent as a condition for entrance into a college of pharmacy. This will imply a great advance on the part of many of our colleges, but we are looking now to the ultimate benefit of the students.

I am aware that many young persons will regard it as a hardship to have to complete a high-school course before they can be admitted to col-

* Since this paper was read, I have heard of two who have no entrance requirements, one of them compelling all freshmen to take a course in arithmetic as a part of their first year's college work.

lege, but the hardship is, in most cases, due to want of appreciation of the value of a liberal education. Tuition in our high schools is free. In most of our schools of pharmacy, whatever instruction is given has to be paid for by the students. In fitting themselves for their life's work, let them get what they can from the State without cost. Let them also lay broad the foundations upon which they will build the structure of their whole education. The question for them to consider is which will be best for their *ultimate* life's work. As I am advocating high-school graduation as a condition for matriculation, you may want to know what reason or reasons I have for taking this position. Having for many years tried the grammar-school requirement, and for a few years something higher, I am able to speak from the results of the two methods.

I suppose that all schools of pharmacy that keep up their standard for graduation have the mortifying experience of seeing some of their students drop out after the first term, and others who have managed to get sufficient credit to secure promotion from the freshman class fail when they present themselves for their final examination. The proportion of this latter number who have grit and perseverance enough to apply themselves vigorously to make up their deficiencies after the first failure, so as to ultimately graduate, is not large. Hence we find that a number of students attend college for one or two, or even three years, and fail to graduate. This result is mortifying to them, to their friends, and to the faculty. Since we demand two years of high-school work, and, as a result of the campaign of education which we have been carrying on, have received a large proportion of students holding high-school diplomas, the number of such cases has been so greatly reduced that it has now become quite an exception for our matriculates to ultimately fail of graduation. This has not been because our final examinations have been less strict; on the contrary, our requirements for graduation have been constantly made more severe from year to year. More diligence in study is now required in order to pass the finals than ever before. But we are getting a better class of students. We have almost eliminated the lazy, the indifferent and the careless out of our school. Experience has taught us that the young person who stays in school long enough to complete satisfactorily a high-school course acquires the student habit, and hence attends regularly all of the didactic and practical instruction, the reviews and examinations, and generally makes a serious business of all the college work. It is in this regular, steady, business-like attention to the work of the college that we find the marked difference between the high-school graduates and those who have had only a grammar-school training. It is not merely that the former knows more than the latter, though the knowledge acquired is worth all it has cost. But the essential value of a high-school course to our pharmacy students consists in the fact that they have acquired habits of study, and have had the faculty of receiving and retaining instruction

much more fully developed. I cannot too forcibly insist upon this point. While it is true that we sometimes find one whose early advantages have been limited, who has come to us without a high-school diploma, but after coaching or private study has passed our entrance examination, has made a good student, the average progress of the high-school students has been greater than that made by other students. I attribute this marked difference not to the superior intelligence of the high-school student, but to the superior training which his mind has received before he comes to us. During the years of high-school life the mind is particularly susceptible to culture, and at this period the benefits of mental training are especially manifest. I deem it, therefore, greatly to the interest of the student himself that he should have received a high-school education previous to his undertaking the study of pharmacy.

I know that some will say that it would be a hardship to young people of slender means to require them to devote four years to attendance at high school. To this I reply that these are just the persons who would be most benefited by such a course. If a young man possessed of ample means enters pharmacy handicapped by defective education, and afterwards makes a failure as a pharmacist, he has the money to go into some other business. But the man who has to depend upon his brains alone for a living, cannot afford to start out in life under conditions that invite failure. He has no father or rich uncle to boost him along and give him another chance. Let him accept the patrimony of his State or township, and with the capital thus received make his fight, and make it right.

But I have referred to the cases of some young men who drift into the drug business from the errand-boy class. Shall we bar them out? Is pharmacy only for the well-to-do? By no means. In all large cities there are night schools and classes of various kinds, where instruction can be had in almost every department of education.* Most of these schools are a part of the public-school system and are free. In smaller towns the facilities are not so great, nor so commonly free, but where there is a determination to obtain such instruction it can almost always be had. But if a student finds that he cannot get the preliminary education he needs in his own town, he can obtain it in any city where there is a college of pharmacy. There, at least, will be found evening high schools, or other night schools in which studies are largely elective, and there he can, while earning his daily bread, fit himself to take an entrance examination covering about the same ground as the regular high-school courses.

You will see that this means hard work and many privations for the student. But he is just at the period in life when habits of application and self-denial are most easily acquired, and once acquired are most likely to be permanent. It is our duty to encourage the formation of such habits, and not to lower our standards to those of the easy-going or

*The Y. M. C. A. alone had 29,000 students last year, and expect 35,000 this year.

fices made in most cases by his teachers in his behalf. Manliness is not developed in "flowery beds of ease." We are to-day suffering from our past want of backbone in this matter, and shall continue to suffer so long as we yield to the wishes of those who are unwilling to make some sacrifice in order to enjoy the privilege of a course in a college of pharmacy.

I have stated that I base my arguments, in part at least, on experience.

Since the California College of Pharmacy has demanded higher qualifications for admission, the number of students who failed to complete their course has been much smaller, as the following statistics will show. They also indicate that young men will take pains to qualify themselves for entering when they know that better scholarship is demanded of them :

Year.	Number of Matriculates.	Percentage with High School Diplomas.	Percentage who were Graduated.
1896	64	6.	28
1897	44	9.	44
1897-1898	31	9.6	58
1898-1899	48	12.5	73
1899-1900	43	44.2	80
1900-1901	45	39.	74

It will be observed that the proportion of matriculates who finally graduate follows quite closely the percentage of high-school graduates.

Some years ago the California College of Pharmacy, realizing that those young men who had the best preliminary education made the most satisfactory students, and generally get more for their money than those who had less education, demanded of applicants for admission that they should have completed one year in a high school, or that they should take an examination covering the work in that year. At first this was felt to be a hardship, and for two or three years the number of matriculates was reduced. At the same time an intimation was given that the college would, probably before many years were over, raise the entrance requirements still higher. After a few years this was done, and we now require two years' high school work. This had led some young men to complete their high school course before entering college. And it is a pleasing fact that at the present time nearly all who matriculate make good progress and are ultimately graduated. That the gain has been one *to the students* cannot be questioned ; that the college has lost money by the step, will also not be questioned. But the young men who graduate after completing high school are, everything else being equal, better equipped for the battle of life than those who attend college with only a grammar-school qualification.

But the benefit is not confined to those students who possess these high-school diplomas. The whole school has been improved. We are getting a more cultured class of students. The general discipline has been better. The progress of the student body is more uniform. We suffer less from the retarding influence of those who, finding themselves out of place among hard-working students or not able to keep up with others in their studies, become indifferent, and in a short time a somewhat disturbing element. In this way the whole college has been benefited.

How have we been able to carry out this plan? Certainly not by simply announcing our conditions and abiding the result. We have made persistent efforts to educate the people of the Pacific Coast to the idea that such preliminary education was for the students' benefit, and would, in due time, be demanded. And when the time came the demand was made, and met in a satisfactory degree. It took several years to prepare these young people for the advance, but the result is worth the effort and the cost. No one on the Pacific Coast wishing to enter our school expects to be admitted on a grammar-school diploma. And the feeling is growing that the best investment a young man or woman can make who wishes to become a pharmacist is to secure a high-school diploma before going to college.

Our experiment in this matter has been so satisfactory that we feel justified in urging all our colleges that are aiming to do the best work to do the same. Let them announce that at a certain date, to be determined after due consideration, all students will be required to be graduates of high schools or of secondary schools of equal grade, or to take an examination in the studies covering such a curriculum, and at the same time let them make it known that they heartily indorse this requirement in the interest of the students, and the battle will be won. In the mean time let them keep up a campaign of education in order to prepare parents and prospective students to regard such preliminary education as a matter of course.

A word in closing : While colleges of pharmacy aim to help industrious students to equip themselves for their life's work, they also seek to elevate the intellectual and social status of pharmacists. Can you imagine anything better calculated to render work in this direction effective than the general adoption of the course I am now advocating? The lazy, the easy-going, the illiterate, would be eliminated from our ranks, and their places filled with an equal number of a superior type. Let half a dozen of our leading colleges set the pace, and the rest would soon follow. For two or perhaps three years there would be a loss of revenue, but what an ultimate gain !

I contend, therefore, first : that it is for the best interest of the students of pharmacy that they should have the equivalent of a high school education before entering college, and that they should not be admitted without such preliminary education.

Secondly, that the difficulty of meeting this requirement will disappear in a few years, when students have had time to adjust themselves to the demand.

Third, that in the meantime those who have not made their plans early enough in life to secure a high school education before going to work in a drug store will find the means of making up their deficiencies by diligent study in night schools and by other means now so commonly provided for such cases in all cities.

And fourthly, that the intellectual and social status of pharmacists would be greatly improved by such a step.

Mr. Hancock moved to receive the paper and refer it for publication, and the motion prevailed.

THE CHAIRMAN: The next paper is entitled "Now is the Time," by Mr. Joseph P. Remington, and he has asked me to simply present it by title and let it take the usual course. It refers to the matter of requirements by boards of pharmacy that applicants for certificates be graduates in pharmacy; it is a paper along that line.

Mr. Mason moved to accept and refer for publication, and the motion prevailed. The following is the text of the paper:

NOW IS THE TIME.

BY JOSEPH P. REMINGTON.

Eleven years ago a resolution was offered at the meeting of this Association in the city of New Orleans, asking this body for its support of the proposition to require each Pharmacy Board to demand from each candidate for proprietor's certificate, a college diploma or evidence that the candidate had passed the examination necessary for granting such diploma. The introduction of this resolution caused much discussion, and the consensus of opinion reached was that such a requirement could not be demanded then. But of late years, many men who were then opposed to this action have reached the conclusion that "now is the time."

Most of our members are familiar with the arguments pro and con; they touch vitally the large subjects of education and legislation. There have always been, in the past, two sides to this subject. In 1821, when the first college of pharmacy was founded in America, druggists generally believed that the only way to teach pharmacy was to take a boy as an apprentice, and after six years' teaching, or rather, obtaining six years of service, the young man was considered old enough legally to conduct a drug store. But it must be remembered that in those days there were no pharmacy laws nor restrictions of any kind; a blacksmith, butcher or florist could "run a drug store" and dispense poisons, if he wanted to.

For a long period of years the college struggled, and mainly against the idea which some men hold that a college education is unnecessary to fit a young man for the duties of the drug business. It was probably regarded

by many that the colleges should prove their value and right to exist by a long, hard ordeal, lasting eighty years, but it is nevertheless a blot and stigma upon the intelligence and progressiveness of pharmacists that the conviction has not been much stronger in the past, that our colleges, and the noble work that they have done, should be publicly recognized.

What is needed at the present time is concerted action on the part of the colleges and State pharmaceutical associations, and once started, with two or three State laws adopting this reform measure, others will follow as rapidly as circumstances will permit. The American Pharmaceutical Association is on record and is committed to the principle. Several State associations have also fallen into line. The policy of inaction on the part of the colleges and professors engaged in teaching, has proved to be a failure. Of course, it would not be wise for the professors to go in a body to the Legislature and demand the recognition of the diplomas of their colleges; but there are now scattered throughout the various States many graduates of the colleges, and upon these men who are enjoying the fruits of their college work, will fall the burden of securing this long-needed legislation. As a practical measure, the writer would propose the appointment of a committee to draw up a strong appeal to be sent to every graduate of a college of pharmacy in the United States, asking each one to use his influence, and work actively for the passage of a law in his State, demanding that, in future, each candidate for a *proprietor's* certificate shall first produce evidence before the Board that he has successfully passed his examination before a college of pharmacy or department of pharmacy in a university, granting him a degree which will evidence a systematic training in the theory and practice of pharmacy.

Mr. R. G. Eccles was called on and read the following paper:

ÆSOP'S ADVICE TO COLLEGES OF PHARMACY.

BY R. G. ECCLES.

That life is short and time precious all admit. Unfortunately, however, all do not equally realize the depth of the significance of this truism. As a consequence, much of our precious time is wasted or squandered in effort that is useless. To the young, who have life still before them, time is of even more worth, if properly cared for, than to the aged. Time lost is lost forever. We speak of making up for lost time, but there is really no way in which such a miracle can be accomplished. Rest time is not lost time, because it can be made up by extra effort and diligence. Time consumed in doing work that is useless or of less use than it might be is wholly or partly lost. Properly used or carefully conserved time is interest bearing, so that an hour to the young should be of far greater value than an hour to the aged. The student's time is his capital, and the hours he loses while a student wipe out the usufruct thereof for the rest of his life. For a man

sin. For any one to compel others, who have placed themselves in his power, to obliterate from the calendar of kindly fate the most precious among the minutes, hours and days of early life, is crime. To the student himself I would say, in the words of another, "He who would climb the steep where fame's proud temple shines afar has no time to spend, no talent to waste sporting with Amaryllis in the shade and playing with the tangles of Neæra's hair." To the teachers in colleges of pharmacy, I would ask, "Are you quite sure that you are in no way responsible for any loss of time on the part of your students?" Please understand me aright. There is not the slightest intention for a moment of intimating that any of our teachers of pharmacy neglect to put in their best efforts in forcing every student in their care to consume every second of their time in work.

In order to make clear my meaning permit me to recall the fable of the Boy and the Filberts. In this fable Aesop seeks to point out the danger of trying to do too much. The boy put his hand into a pitcher full of filberts. He grasped as many as his hand could hold, but when he undertook to pull out the well-filled hand the narrow neck of the pitcher held it fast. Not willing to lose the filberts and yet unable to withdraw his hand he burst into tears and bitterly complained of his bad luck. "Let go half the filberts," said a man who stood near, "and then try." The boy did so and found he had no trouble in withdrawing his hand. A glance at the catalogues of most colleges of pharmacy seems to the writer to fully prove that there is a decided tendency to do too much. Too many subjects are being taught, too much material is being presented in each subject, and there does not always seem to be sufficient discrimination regarding the relative values to the students of subjects left untouched and those that are made compulsory.

Considering the brief time at the disposal of students of pharmacy, it looks very much as if it was time for some one to cry out "let go half the nuts and then try." Precious time is being wasted by effort that fails to accomplish that which true education should accomplish. Habit sticks. The contents of a crammed memory are "like the snowflake on the river, a moment white then melt forever." What sort of habits are being established among our students? That—and that only—is the test of the value of their education. If crowded too hard, in the very nature of things, they must be becoming slovenly. No living man can do good work on a rush. If too much is expected of them they become discouraged and careless. Habits of filthiness are engendered in the laboratory where there is not time to clean. Habits of destructiveness creep in unawares as piece by piece of apparatus is broken under a pressure of too much to do. Habits of wastefulness are encouraged by lack of time to weigh and measure with a nicety the chemicals that are to be used. Habits of frivolity arise as they become conscious of the fact that they have only

time to PLAY experiment, and perceive that they are taking part in what is more or less of a farce. Habits of superficiality are acquired when, trying to master a subject, they find they have only just time to skim its surface. Habits of neglect come when they learn the utter uselessness of trying to do more than make phonographs of themselves, able to talk out answers to questions the soul of which they must remain strangers to. Habits of untruthfulness result when after fruitless effort they find themselves endangered in their ability to catch a diploma; to see in experiments that which they have been told they should see; to find in books that which they understood they ought to find, and by imitation from the whole hollow pretence at knowledge which they are compelled to put on. While their chemistry and botany should have established a firm mental habit of induction, they do not even know what induction means. While they should have acquired a keen appreciation of nature's samenesses and differences, they leave college mistaking likes for unlikes. While they should have been able to perceive immediately how to apply each little piece of knowledge where it belongs and when it is needed, no such mental habit has been established. They may know that a solution of iodide of potassium will give a scarlet precipitate with a solution of corrosive sublimate, but it will never occur to them how to use this knowledge when some one asks them for a test for either salt. Placed in a library of books, they will be wholly unaware of how best to hunt for such information as they need, because no habit of book-searching has been acquired. But few of the things they have been taught have been ground in by constant iteration until they have become second nature. They have acquired no just appreciation of the relations the various things they have been taught bear to each other. They may know something about botany, something about chemistry, something about pharmacology, while they have but the faintest kind of conception as to what it all signifies to a pharmacist.

In how many of our colleges of pharmacy have our students time for slow, careful deliberation in work and thought at every step of its progress? In how many are they certain to acquire habits of clear, instead of muddled and misty, thought? In how many do they acquire the knack of thinking original thoughts, putting questions to nature and getting satisfactory replies? In how many do they fix the habit of precision which alone can make a scientific man? Von Baeyer once said to Professor Ramsay that he did not care how much or how little a man *knows*, but he did wish to find out if that man had learned to *think*. The precise and methodical thinker is the man that makes his mark upon the world, but such a man can never be a product of over-pressure nor evolve from an institution that forces too many studies upon its students. Professor P. W. Latham, of Cambridge University, once said to a class whom he was addressing: "A sound knowledge of what is absolutely essential is what should be conveyed to you and what should be rigidly exacted from you

in the examination—and nothing more. . . Shall I surprise you if I say, do not strive in the limited time before you *to know too much*, to cram in too much science, but learn to *apply* what you know. . . . There are men who never have done and never can do anything because they know too much, whilst others possessing comparatively small knowledge are so dexterous in its use that they have risen over the heads of others far their superiors in acquirements." "Let go half the nuts and then try" is just what such advice means. It inculcates the doctrine that whatever is worth doing at all is worth doing well. It is far better for a student to learn ten things perfectly than to gain a smattering of a hundred things. Superficiality will out. No young man with but a veneering of knowledge, however extensive that veneering may be, can ever long pass muster as a proficient man in his business or profession. There he must have true knowledge, but that is quite consistent with ignorance of many things outside his special field. Indeed, one should be proud of the fact that he is ignorant of something, since it shows that one has diligently sought to conserve valuable time by spending it where it could do the most good.

In this age of division of labor and of thought he is the fittest who can make the most perfect adjustments, mental and physical, within a definite sphere. Prof. Bodine once said at the meeting of the American Medical Colleges in this city, that "From the lowliest craft to the highest professions only the fittest survive; only skill succeeds. Ithuriel's spear of celestial temper has but to lightly touch falsehood and it withers. Pasteboard armor may turn the point of a tin rapier, but only steel mail can resist the blows of the Damascus blade with which the age is armed. With the growth of the masses in knowledge rises the demand for thoroughly furnished men." It is not to be understood from all this that the writer advocates the taking off of all pressure from students and allowing them to take their ease and their time in accordance with their special whims. With Prof. Bodine I would say: "Put a man under pressure if you would get the best out of him, as flowers yield their sweetest perfume when bruised." As has been well said: "Men are like tea, flavorless until put in hot water." By all means put on your pressure, but let it be definitely placed so that it will do its work. If teachers were farmers I would ask them, as has been done, not to cut more with their plow than they can turn. Do not think that I would do away with the special chairs in our colleges of pharmacy that have of late years been added and that may continue to be added in years to come. I would, however, counsel a careful consideration of the plan so rapidly gaining favor in our highest colleges and universities, of having students select from among the many chairs those which shall be their choice and demand a certain number of studies and a definite result. All students do not intend to pursue pharmacy under the same conditions, and therefore they will not all require the same training. By allowing them a choice there will be greater adaptation, and by

limiting the number of subjects studied there can be increased pressure brought to bear upon them along the lines of greater precision. Permit each student to let go half the nuts he now seeks to pull from the pitcher of education, and see if they do not soon bring forth a good handful.

Mr. Ebert moved to receive the paper and refer for publication. Carried.

The next paper was on the subject of uniform pharmacy laws, by Mr. Albert E. Ebert, and at request of the author it was referred for publication.

THE CHAIRMAN: This paper from Mr. Ebert is one of several we have received from our ex-Presidents. I would suggest that the balance of these papers be referred for publication also. They are from Messrs. Sloan, Patch, Whitney, Patton and Hancock.

Mr. Mason so moved, and the motion prevailed.

The full text of the papers thus referred is as follows:

NATIONAL UNIFORMITY IN PHARMACY LAWS.

BY ALBERT E. EBERT.

The desirability of uniformity in the laws regulating the practice of pharmacy in the various states of the Union has long been recognized by pharmacists, and many suggestions have been made from time to time with regard to the manner in which such uniformity might be brought about. It is generally admitted that progress in this direction can be had only through national legislation, but it is commonly assumed that constitutional limitations will prevent the national government from taking action in this regard. I believe that a bureau of public health might be organized as a division of the Department of the Interior, and might be given control of such affairs as pertain to the health of the people as a whole, and over which the government now exercises supervision, for example, quarantines. The establishment of such a bureau might serve as a base for further action, and as the public mind becomes educated to the importance of the subject, greater powers would be entrusted to this bureau—by constitutional amendment if necessary.

Whether this suggestion be deemed feasible or not, I would at least emphasize the importance of an early agitation of this "burning question," and would recommend that our special committee on National Legislation take up this matter and ascertain what steps may best be taken toward starting a movement, preferably in conjunction with the American Medical Association, which shall have for its object the uniformity of laws affecting pharmaceutical (and medical) practice throughout the country.


In thinking over the question regarding the possibility of securing national uniformity in our pharmacy laws, the additional suggestion presents itself, Why not agree on certain fundamental features provided for in these laws, and which are generally admitted to be of the greatest value? It

will surely admit of no denial, that among such features, the requirements for entrance into pharmacy deserve the first consideration, because affecting not only the number of those entering our profession and therefore acting as a restrictive measure, but more especially because of the effect of these on the intelligence, education and skill, upon the "morale," one might say, of the entire body pharmaceutic.

It is universally conceded that the practical, every-day knowledge and skill required of the pharmacist cannot be attained without a certain amount of actual experience in a dispensing pharmacy, nor is it less obvious, in this age of educational advancement, that systematic technical instruction is at least equal in importance. A reasonable insistence on both store-training and school-instruction would afford the best basis for an interchange of state certificates, and such interchange is acknowledged to be the strongest argument in favor of a national pharmacy law.

It should not be a difficult matter to agree on the amount of drug-store experience required, for in a great majority of the states this is fixed by law at four years, and this amount is reasonable and might well meet with general acceptance.

But few state boards of pharmacy insist on any evidence of school instruction in pharmacy other than obtained through an examination conducted by the board itself. These examinations vary considerably in scope and stringency in various states, hence the unwillingness of some boards of pharmacy to recognize papers granted by other boards. And just here, let me offer a criticism of the prevailing system of state-board examinations. A pharmacist may be successful and prosperous, and may have that prominence in his state board of pharmacy, and yet there is hardly a chance in a thousand that he will be competent to examine into the pharmaceutical educational qualifications of candidates for registration. It should require no argument to convince that this part of the examination should be entrusted only to those who by their training and education are qualified to conduct it, that is to the teachers in our schools of pharmacy. It is absurd to suppose that an untrained examiner can in the brief time usually allowed for such an examination, inquire intelligently into the knowledge of chemistry, materia medica and toxicology which an applicant is expected to possess. Therefore, no one should be accepted for examination by a board of pharmacy unless he can show evidence of preparation in the form of a systematic course of instruction at some recognized teaching institution. Once this fundamental fact is recognized, the work of the state board examiner will be simplified, for he can then devote his entire time to an inquiry into the character of the drug-store experience which the candidate possesses as shown by his skill in reading and compounding prescriptions and in recognizing common drugs and chemicals and such other questions as have a practical bearing in the managing and conducting of a drug store, and thus determine whether the applicant has made good use of his opportunities.



When these methods are adopted, interchange of certificates will be accompanied only by the practical examination just alluded to, and by the evidence of technical training in a recognized school. To the practical examination, no one, however long the time since his original certificate was granted, could reasonably object.

The question of what constitutes a recognized school will be solved by the establishment of the Association of Teaching Faculties of Schools of Pharmacy, recently organized under the auspices of our Association. Let only those schools be recognized by the boards of pharmacy, which conform to the requirements of this association of teaching faculties, and thus we will insure to that association sufficient power to enable it to establish higher entrance requirements and more thorough courses of instruction.

Personally, my idea would be to have the state universities of the various states furnish instruction to our clerks at a nominal fee. Since the state requires of pharmacists a certain degree of education, it should stand ready to furnish this education at as small an expense as possible.

Certainly, the relation of pharmacy to the public health deserves the support now given in this manner to architecture, agriculture, engineering, chemistry, and other vocations. Free instruction would by no means increase unduly the number of pharmacists, for it would be accompanied by higher entrance requirements. The result would be fewer and better schools and ultimately fewer and better pharmacists and clerks and a higher standing for our profession.

A BRIEF RETROSPECT.

BY GEO. W. SLOAN.

The American Pharmaceutical Association was organized by some of the most distinguished apothecaries of this country, and I question whether Prof. Procter had a superior in the world during his prime. Procter, Parrish, Colcord, Markoe, Squibb and some others, cheerfully gave of their wisdom and experience, to lay the foundation for this great organization. Another generation came to the front, and although it seemed for several years as if the commercial side had eclipsed that of pure pharmacy, yet our friend Hynson, together with Kammerer, has shown that though latent, pharmacy was not dead, but awaiting the call to activity to spring up with a new and surprising vigor.

If the spirits of the departed do return to earthly scenes, I am sure that our old friends enjoyed the active work of the Section on Pharmacy at the St. Louis meeting.

The influence this organization has exerted upon the druggists of the country can be seen in the growth of Schools of Pharmacy all over the land. This, with the various state organizations, has brought about the adoption of pharmacy laws in many of our states; and all taken together evince the general tendency towards an advance in pharmacy. I can but

say, "All honor to the noble and scholarly men who organized the American Pharmaceutical Association."

PHARMACEUTICAL LEGISLATION AND EDUCATION.


BY HENRY M. WHITNEY.

A brief paper has been asked for this Section from all the ex-presidents of the Association. It seems to the writer of this paper that pharmacy legislation, for the present at least, has been exhausted. At Richmond, in 1900, on Saturday, May 12th, there was formally adopted a "Model Pharmacy Law." If any one has the courage to question the wisdom of this action, let me assure him of the fact that it was the result of many years of experience, research, study, and full and free discussion by the ablest and best minds in this body. Possibly, by the accumulated experience and practical results during the next ten or fifteen years, something better may be produced; but, in my opinion, any attempt to "monkey" with this subject again for several years will surely convince all of the hazard of *too much legislation*. *National* legislation affecting the practice of pharmacy is another matter.

EDUCATION.

In the Proceedings of 1900, pages 323 to 329 inclusive, the *preliminary* education for students of pharmacy is ably presented, and while such a preparation and pharmaceutical college course would have been difficult, if possible, sixty years ago, the rapid progress and development in every industry, the work and influence of this Association, has made such preparation and college education not only a necessity but comparatively easy of accomplishment, as such preparation and education has by our public schools and numerous colleges made it available in nearly every section of our country. Some of the older members of this Association, notably the late and revered Procter and Maisch of the city of Philadelphia, may be properly named as honored leaders in this work.

We all know the strenuous efforts that have been made in all departments of education, and the present advancing conditions and requirements in the practice of pharmacy. It may be of interest, and encouraging, to record at this fiftieth anniversary of the A. Ph. A., the experience of two ex-presidents of this Association. In 1844, an ex-president, now located at Chicago, and the writer, entered the same drug store as apprentices upon the following conditions: Agreement to remain five years; store to be open every morning at six o'clock or before and closed at ten or eleven in the evening; salary for the first year \$110, paid quarterly, and an increase of \$10 each year for the full term, a total of \$650 for five years of service, an average of about 35 cents per day of twenty-four hours, for there was no agreement for an afternoon or evening out excepting half a day on Sunday, provided you went to church or Sunday-school.



It was the custom in this store, if the apprentices were particularly meritorious, to allow one week's vacation during the year, and sometimes a gift of five to eight dollars was presented for traveling expenses, but it was expected that part of the week of vacation should be used in the interest of the store.

I well remember paying one dollar and twenty-five cents per grain for aconitine in New York City, and trying to sell at wholesale our "Charcoal Tooth Paste" in Baltimore, and my first visit to this city and to Girard College. To the junior member of one of the leading wholesale drug houses of this city I have always felt grateful for his many kind attentions during the afternoon and evening of that memorable day; for returning late in the evening alone through Chestnut Street to my hotel I was so frightened by an unusual (to me) incident that I ran faster than I ever did before or since, and slept very little that night, I assure you.

Most of my vacations were on the road, for I enjoyed traveling and the little business entrusted to me.

Three, and sometimes four or five apprentices were in service at the same time. An associate during part of my service I recall, and known to some of you, was the late Chas. T. Carney, of Boston, who joined this Association in 1853.

It was the rule for *all* the apprentices to sleep in the store. Exceptions were made when accommodations were limited or parents insisted that their boy should sleep at home for the first year. Beds were folded up under the counter during the day, and at night raised about ten inches from the floor on boxes. We also had at one time bunks for four, as on a ship, in a small room connected with the back shop; and also I recall a room just large enough for a small bed, occupied by two of us, entered from the back shop, and raised from the floor to barely give standing room from the floor. Often, if roused by the night-bell directly over our heads, a *sudden rise* and contact with the ceiling would sometimes assist in a more rapid response to the night call.

One physician who was a frequent disturber of our slumbers always shouted from outside, "Don't stop to shave." This was slightly sarcastic to a beardless youth of sixteen. The night calls were frequent, rarely less than two, and often four or five. One experience in the night, during my second year's service, will be sufficient to show the tribulations of those days, which legislation, education, and telephone service have changed. A recipe, four oz. mixture, calling for one drachm of hydrocyanic acid, was handed me at midnight. I had never heard of that acid, but the prescription must be filled, so, offering the ladies chairs, I looked it up, and judge of my amazement, if not horror, when I read of an English apothecary, upon smelling this acid, falling to the floor and dying instantly. Assuming as pleasant a face as possible, I announced to my customers that I could not find one of the articles called for, but if they would allow

me to lock them in the store, I would go to my employer, learn where it was, and then dispense it. The ladies thought I was very kind, and I started on a run of not less than one and a half to two miles out. By shouting, and throwing small pebbles at the window, I roused the sleeping proprietor, told my story, and the fatal effects of even smelling of the stuff. A subdued, though audible, smile was followed by my first lesson in the official *dilute* hydrocyanic acid. A three or four mile tramp at midnight is only an incident of the old days of an apprentice in a drug store.

You must bear in mind that this store was decidedly the prominent and leading drug store of a city of forty thousand or more, and our library was exceptional for the period, namely,—one old Pharmacopœia, Dispensatory, Attfield's Chemistry, and Dunglison's New Remedies. Thompson's Conspectus was a much prized gift to me by the firm. Pharmaceutical literature, so abundant and available to-day, was hardly dreamed of outside of this city in those days of five years' apprenticeship.

The senior member of the firm was one of the best men I ever knew, but, having a large property for the period, gave little attention to the store. He was a bank director, treasurer of a railroad, and had other outside duties.

The junior partner, brought up by the senior, enjoyed the full confidence of the physicians and the people, was treasurer of the church, life insurance agent, and in such general demand outside that nearly all the work of the store was done by the apprentices.

Camphene was used for lighting the store, and a large iron box stove, burning wood, for heating. The special instruction received was given in answer to questions when two or more of us were putting up Epsom Salt, soda, and seidlitz powders. Our sales of Epsom Salt, in one, two, and four oz. blocks, were from 25 to 30 lbs. every week.

When I think of preparing licorice root and rhubarb for 40 gal. of sweet tinct. of rhubarb with the mortar and pestle; powdering Spanish flies, rhatany root, herbs, etc.; charging 13 gallon copper fountains alone; making thousands of C. C. pills, and various pill masses and ointments, all by hand; I often wonder what boys of to-day would say of the past, and if the next fifty or sixty years will make as great a change.

As we look back and review the average conditions of 1850, the persistent work of this Section on Education and Legislation, it surely should be encouraging to the younger members, as it is gratifying to the older ones, that so great an improvement has been made.

Possibly the hazard was so great, the general trust in the apothecary so complete, that the care and personal responsibility were felt more than to-day.

Enough has been said to present a contrast and clearly exhibit the great work accomplished.

It seems to me but simple justice to record that in the experience of

the past, such as recipes for "14 grain doses of sulph. morphine," "Acetate of morphine 2 oz., dose, teaspoonful," when spts. of acetate of ammonia was wanted; "2 drachms tartar emetic" in a two oz. mixture, when 2 drachms of *wine* of antimony was required; and many such errors, have made legislation and education for both *physician* and pharmacist a necessity.

We have many active members who are doing most loyal, heroic and helpful work: note the recent work on practical pharmacy and dispensing. Of all associations or efforts in the improvement and perfection of pharmacy, of practical value, meriting and entitled to the aid and support of every pharmacist in the land, is this, the A. Ph. A. That its future may be as useful, if not more helpful, than the past, is the earnest wish of the writer.

PAST, PRESENT AND FUTURE.

BY E. L. PATCH.

The constant demands of a business of great detail and a growing interest in local affairs have fostered a disposition to permit some one else to do all the writing and talking while I enjoy the role of the reader and listener. I would have followed this inclination on this occasion, but for the frequent reminders from Chairman Eberle that as a past President of the Association I should make some sort of contribution to the Golden Jubilee proceedings.

I entered the retail drug business on my own account before I was nineteen. I lacked the long preliminary training under several preceptors in many stores that supplies the broad experience to some, and was a chaser after ideals, with rather more than the usual youthful enthusiasm.

My partner, Mr. Henry Canning, a life member of this Association, sympathized fully with the aim to establish a model prescription pharmacy in which the soda fountain, the cigar case, and confectionary counter should be conspicuous by their absence, and in which neither a proprietary medicine nor an advertisement of any should appear in sight. From the first, success in large measure crowned our efforts and stimulated enthusiasm for higher pharmacy. I attended the Massachusetts College of Pharmacy and by a dispensation of the authorities graduated under age in 1872. Immediately after, at the suggestion of Mr. Samuel Colcord, then president of the College, I joined the American Pharmaceutical Association. I recall the eagerness with which I waited for the proceedings of that year, containing among others Prof. Parrish's paper on Preliminary Education, and five by Dr. Edward R. Squibb. I learned from this volume that while the retailers were so careless in putting up their Seidlitz Powders as to have the Seidlitz mixture range from 100 grains to 250 grains per paper, and the tartaric acid from 18 to 54 grains, the employees of the manufacturing pharmacists sometimes left out two-thirds of the quinine from their elixirs, and rarely hit the mark of excellence their labels called for.

In the same volume we learned that the model of a pharmacy law adopted at the Chicago meeting in 1869, copies of which were sent to each State, had aroused considerable interest, and laws had been enacted in the States of Rhode Island and South Carolina, and in the cities of San Francisco, Baltimore, Philadelphia and New York.

The proceedings that year were sent to nine colleges of pharmacy—New York, Philadelphia, Massachusetts, Maryland, Louisville, Cincinnati, Chicago, St. Louis and Kansas.

The report of the committee on drug market gave as ruling prices those in the left hand column below, while the right hand column gives 1902 prices.

		1902.
Potassium chlorate.....	45 to 65 per lb.	.08
Morphine sulphate.....	5.40 to 5.50 per oz.	1.85
Quinine sulphate.....	2.35 to 1.60 "	.25
Citric acid.....	.95 to 1.15 per lb.	.34
Oxalic acid.....	.26 to .30 "	.05½
Tartaric acid.....	.60 to .63 "	.29
Balsam copaiba.....	.75 to .90 "	.32
Balsam tolu.....	.90 to 1.00 "	.20
Calabar beans.....	.85 to 1.25 "	.28
Oil lemon.....	5.50 to 6.00 "	.75
Chloral hydrate.....	2.25 per lb.	.90
Opium.....	5.50 " duty paid	2.85
Oil almonds ess.....	12.75 "	5.75
Oil anise.....	3.50 "	1.15
Oil bergamot.....	5.00 "	1.90
Oil cassia.....	2.50 "	.62
Oil clove.....	1.90 "	.60
Oil cod liver (Norwegian).....	2.00 per gal.	1.25
Oil sandal wood.....	13.00 "	4.00
Oil wintergreen.....	4.60 "	1.50
Potassium bromide... ..	1.30 "	.46
Potassium iodide.....	8.40 "	2.10
Rhubarb select.....	1.95 "	.60
Cardamoms.....	2.80 "	.65
Floral waters, 5 gal. can.....	13.00 "	5.25
White wax.....	.67 "	.42

Sugar of milk was not made in the United States, and the price of the imported was 33 cents per lb. To-day the price is controlled by an American trust, and some individual American houses use over 60,000 lbs. annually, costing from 14 to 16 cents per lb.

The comparison exhibited by these columns shows a downward tendency in costs, and might demonstrate how much less capital is required to start in business to-day than thirty years ago, and partially explain the multiplicity of stores, but probably the fewer dollars are harder to get and harder to keep than the many of former days.

when that is stimulated and guided by the interest and encouragement of maturer years, something of good is sure to come, and joining this Association early in life, and engaging in work for the local College of Pharmacy, urged forward and sustained by some of the founders and early members of this Association, Sam'l M. Colcord, James S. Melvin, Henry Ware Lincoln, I. B. Patten, Ashel Boyden and Joel S. Orne, proved a permanent source of development and helpfulness that was further intensified by attending the meetings and coming in contact with earnest workers from all over our country.

In 1872 I believe our Association had 973 names upon its list of active and life members, and these represented 14,000 stores in which medicine was sold. Of the total membership 78, or about 8 per cent., belonged to Boston and its immediate vicinity. Of this number, the names of but 13 now appear upon its rolls. Of the others I have personal knowledge of over forty having passed onward to their reward, and believe this is true of many of the others.

Of our present membership of 1222 active and life members, representing about 44,000 places where medicine is sold, 53 or about 4.34 per cent. belong to Boston and immediate vicinity. These figures might indicate a decrease in interest in higher pharmacy, but may be accounted for by the multiplication of state and local associations that supply the majority of pharmacists with all the privileges and advantages that they demand.

Thirty years ago training in our few colleges of pharmacy was rather elementary. In some cases lectures upon chemistry, materia medica and botany and pharmacy, with practically the same lectures repeated each year, concluded by a three hours' oral examination before the entire Board of Trustees, was considered to amply qualify one to hold the degree of Ph. G. There was no graded course of instruction nor any practical instruction in any department. To-day there are probably ten times as many schools of pharmacy, all giving graded courses of instruction with laboratory teaching in general and analytical chemistry, practical and dispensing pharmacy, microscopy, toxicology, and urinary analysis. Undoubtedly the graduate of to-day possesses much higher training than those of thirty years ago, but he seems to be less satisfied with the substance and more eager for the shadow, if we may judge from the increasing number of institutions which are giving the degree of Doctor in Pharmacy for the same or inferior requirements as are demanded by others for the honest title of Graduate in Pharmacy. The fact that every quack who may, calls himself doctor, and that the ordinary public has come to use the title so freely, that it is cheapened to a "ten for a cent" value, does not count. The honorary degrees of D. D. and LL.D. so frequently conferred by our colleges and universities, and those of Doctor of Science, Doctor of Philosophy, etc., that usually represent thorough

training and high attainment, furnish a good proportion of gold to offset the brass and inspire some of our friends to advocate seizing upon the borrowed glory for the diploma of the graduate in pharmacy.

Instead of adopting such a degree, tending to confusion and misrepresentation, one should be adhered to that is as distinctive as possible. The best results will come to the professions of pharmacy and medicine by keeping them wide apart in training and titles, but educated to work in harmony. We have referred to the great advance in the requirements of schools of pharmacy, but it is no greater than the advance in all other professional and technical schools. When I was a college of pharmacy student I was acquainted with many students at Harvard Medical School. It then occupied the old North Grove street building and I fancied some of the boys were quite as proud of that portion made famous as the scene of the murder of Parkman by Prof. Webster, as of their laboratories and dissecting room. Men came from the farm, the workshop or the sea with less or with barely a high school grade of education, and after two years' course of study scattered broadcast to hold in their hands the mightiest of all problems, life and death. To-day the same institution is housed in a magnificent building that is soon to be replaced by a group of buildings costing with their equipment some millions of dollars. One must be a graduate of a college or university to gain admittance and must undergo four years of severe training before the university puts her seal upon him as qualified to handle the problem his predecessors grasped so lightly.

In view of all this we conclude that not alone in pharmacy but in all professions and callings the imperative demand and necessity of the hour is a higher education and more thorough training. It undoubtedly is true that it does not secure the same proportionate financial return as came in the past with a much poorer equipment. This feature is incidental to increase in population, to general diffusion of knowledge, to concentration of capital, to the solidarity brought about by rapid means of communication and travel, all intensifying competition to the highest degree.

The old school men who have seen the retrocession of profits with the increased arduousness of effort, find it hard to face the new conditions; but let us not foster a fault-finding temper that will discourage the newcomers who never knew anything better. Let them tackle the problem of the present with all the hopefulness and push that belong to their time of life.

I question if any young man of to-day, possessing the same equipment of ability, education and capital that some of us started out with, could find the same degree of success in legitimate pharmacy; but we should take comfort in the fact that there are many better equipped in all these particulars, and that pharmacy of to-day is safe in their keeping.

As to the future. The unexpected so often happens that I gave up being a prophet some years since. I am sure of but one thing. The future of pharmacy will be largely influenced by what its votaries are aiming for and accomplishing to-day.

NATIONAL PHARMACEUTICAL LEGISLATION.

BY JOHN F. PATTON.

I am of the opinion that it will be a long day before we can get any legislation of a national character in the interest of pharmacy, except it be along the line of pure foods, which would deal more with chemistry than pharmacy. We can, however, prevent legislation that would be inimical to our interests. This is work usually developed in State legislation, and would naturally be taken cognizance of by the Legislative Committees of our State Pharmaceutical Associations.

In a republic such as ours a decided repugnance is always manifested towards any law that bears the ear-mark of paternalism. In the various bills before Congress in the interest of pure food, the strong point is in the honesty of branding. There is a crying need of a revision of patent laws, for which a good deal of energy has already been expended. In the matter of education for the pharmacist, I cannot get away from the fancy of a regular apprenticeship and drug store experience. This fancy is based on my observation and knowledge of the difference between the quickly made pharmacist and one who has served a regular apprenticeship. This difference is so manifest in the work of the mechanic, the skilled workman, and the botch. Pharmacy is crowded with pharmaceutical cripples, as witness to the present demoralization, making possible all sorts of schemes for bettering their condition without taking into account the very necessary step of first bettering the man. We may have to get back to first principles to settle many of the questions now vexing pharmacy. The long and wearisome years of drug store apprenticeship have a tendency to develop the mind and improve the judgment in that they hesitate to invade a territory already occupied, whilst the rapidly made Ph. G. with confidence enters upon a field already congested with drug stores to the verge of suffocation. How to help these chaps is a question. Whether they are worth helping is a more practical question.

REMINISCENCES.

BY JOHN F. HANCOCK.

At 5 o'clock on the afternoon of October 15th, 1851, at the New York College of Pharmacy, 511 Broadway, New York, the timber for a new craft, afterward named the National Pharmaceutical Convention, was collected, assorted and inspected by less than a dozen improvised but earnest workmen.

Its organization was effected by the election of Dr. C. Z. Guthrie, of New York, as president, and Alfred B. Taylor, of Philadelphia, as secretary. The president in his inaugural address expressed his thanks for being elected to preside over the first National Convention of Apothecaries and Druggists ever held in the United States, and there was one member present at that meeting who carved for himself an international name and

character that few persons are permitted to enjoy. Wm. Procter, Jr., whose modest worth gained for him such admiration and respect, probably did more to organize and shape the destiny of the enterprise than any other member, and surely no man ever did more to give it honorable distinction. As the founder of ethical pharmacy in the United States and the supporter of its principles in his writings, his teachings and his practice, he may well be called the Father of American Pharmacy.

The material, thus gathered in the metropolis in 1851, was transferred the next year to the second city of the Union, and in October, 1852, the pharmaceutical ship, although not fully equipped in all the appliances needed for a long and successful career, was launched from the Philadelphia College of Pharmacy, Zane street near Seventh, Philadelphia, and was then christened the American Pharmaceutical Association. Her trial trip was conducted under the able guidance of Daniel B. Smith, of Philadelphia, captain, and the following other officers: Geo. W. Andrews, of Baltimore; Sam'l M. Colcord, of Boston; C. Augustus Smith, of Cincinnati; Geo. D. Goggeshall, of New York, and Wm. Procter, Jr., of Philadelphia. Since that time she has made many pleasant and successful voyages to every section of North America, and it is our earnest hope that her future may be productive of even more good than in the past.

The writer was honored by the American Pharmaceutical Association at Richmond, Va., in 1873, by being elected its captain for the 21st annual cruise, and the circumstances of that meeting call up reminiscences both pleasant and sad. Waiving egotism, it was in some respects one of the most successful meetings in its history.

Many of the brightest lights that the profession has ever seen were in that assembly. Some of them have been extinguished by the hand of pale death, although the refulgence of their scientific and painstaking work still shines and the records they made will be preserved for future generations. Fourteen of those who were present have served as Presidents of this Association.

In Cleveland, Ohio, in 1872, it was resolved to hold the following annual meeting in the city of Richmond, Va.

That meeting ('73) was the first one held after the commencement of the Civil War in a state that had seceded from the Union, and the second one held in a city from which it had not received an invitation. There were only five members of the Association from Virginia at that time, and three of these were in Richmond. The intention was to win back those who had lost their membership during the war and by friendly contact to endeavor to reconstruct the Association at the capital of the late Southern Confederacy.

Although the Association had not been invited to Richmond, the spirit of true southern hospitality was kindled and the pharmacists and druggists organized and appointed committees to prepare to meet the incoming

delegates and give them a hearty welcome. Every one was captured and captivated by the reception committee before they reached the city. Members from all parts of our reconstructed country and Canada were cordially received and made to feel that they were in the hands of their friends. Those who went from Baltimore to Norfolk to join the party from New York, and who then took the Old Dominion Line Steamer up the James River, can never forget meeting the committee on a barge some miles below Richmond. We are pleased to learn that the Chairman (Mr. T. Roberts Baker) who was the first to board us and to give us such a cordial welcome, is present at this Jubilee Meeting, and with the same hearty spirit that he received us then, we wish him many years of prosperity and happiness.

At that meeting everything was done by the local members for the convenience and comfort of the visitors. Carriages were at the disposal of all who wore the Association badge. Abundant entertainments were provided, including a well-remembered excursion down the historic James as far as the famous "Dutch Gap."

The salient features of this 21st session were—the presentation of a check for \$500.00 by the retiring President, Albert E. Ebert, to be known as the Ebert prize fund; the great interest manifested in the plan to hold the meeting of '76 (the centennial year) at Philadelphia, and the abolition of the standing committee on the Progress of Pharmacy, and the substitution therefor of a Reporter on the Progress of Pharmacy. Prof. C. Lewis Diehl, who had come to the assistance of the committee during the previous year, had done the work so effectively that he was unanimously elected to the office in 1873. The members need not be reminded how faithfully and well he has performed that service. His report alone has always been worth the cost of membership.

We can remember among the old guard who seldom failed to be present then, but who have since departed, one by one, to that mysterious realm, Chas. A. Heinitsh, Chas. A. Tufts, Wm. Procter, Jr., E. R. Squibb, Jno. M. Maisch, Chas. Bullock, P. W. Bedford, Geo. F. H. Markoe, W. S. Thompson and others. In retrospect the loss of these old friends gives an air of sadness to the memories of that meeting. It was the last one attended by the lamented Procter, who died during the following February. He had attended all the meetings except the one held while he was serving as a delegate from this Association to the International Pharmaceutical Congress at Paris in '67. From the birth of the Association to the time of his death, his papers had been read annually. The last paper of Procter ('73), "Suggestions to Beginners in Pharmacy," and that of his colleague Edward Parrish ('72), "The Preliminary Education of Apprentices," will always remain interesting and instructive reading for pharmacists. These two men are columns in our national temple of pharmacy and the structure of this Association. Procter and Parrish had

worked together for the advancement of the profession and for the good of this organization until the white-robed angel had beckoned them from this busy sphere. The death of Parrish was announced at the 21st and that of Procter at the 22d meeting. The year was remarkable for the loss of distinguished pharmacists. The death of Procter cast a gloom over the spirit of the late E. R. Squibb. The interest and contributions of these two had largely made the success of the 21st gathering, and it was noticeable that after that meeting the name and writings of Squibb were but infrequently reported in the Proceedings.

Procter and Parrish had worked zealously for the Association from the time of its organization. Squibb, who joined later, became equally zealous and valuable for truth and conscientious work. This trinity of names are enshrined in the hearts of us older members, and it is doubtful if the Association will ever have abler supporters.

Those who knew Procter especially felt that when he related anything or published the conclusions of his researches, it was as though he were standing in a court of justice affirming the truth. Wm. Procter, Jr., stands eminently above the other pharmacists that this country has produced, and his name and fame should be honored by every pharmacist and druggist who respects his title.

The Chairman called attention to a paper by Mr. W. C. Alpers on the subject of a national board of pharmacy, which he said the writer, who had left the city, requested to be referred for publication.

Mr. Ebert made the motion, and it was so ordered.

The following was the text of the paper :

A PLEA FOR A NATIONAL BOARD OF PHARMACY.

BY W. C. ALPERS.

The idea of a National Board of Pharmacy is not new. It has been mentioned and argued many times in pharmaceutical journals and in the meetings of associations. The writer himself has recommended it as often as occasion arose. It is not necessary now to repeat the many reasons why such a Board should exist; there actually is no question about its desirability. But the claim that the establishment of a National Board would conflict with our constitution and interfere with state rights seems to be sufficient to silence all argument and relegate this question to the list of "pia desideria." However, its desirability, not to say necessity, presents itself again and again. Nor is pharmacy the only profession that looks to a National Board as a relief from many annoyances and nuisances. Medicine is in the same position, and physicians also have argued this question again and again in their meetings. At the last meeting of the National Medical Association, held in Saratoga, a solution was proposed by Dr. M. L. Rodman, of Philadelphia, by proposing a voluntary Board of

Medicine, consisting of the head surgeons of the various military departments and a number of prominent lay physicians. Although the committee to whom this proposition was referred reported adversely, it is not believed that the matter will rest there.

The idea of a Voluntary National Board has struck many as feasible, and it is natural that leading pharmacists should at once have taken the hint and applied it to pharmacy. Some leading pharmaceutical journals have also commented on it favorably. That such a Board consisting of leading pharmacists would soon gain recognition from many State Boards seems without question. Its institution would in no way interfere with the existing State Boards, and no compulsion would be exercised on other State Boards and on the candidates to appear before this National Board. Those who are familiar with pharmacy laws in our states know that a great many State Boards could recognize this National Board without further legislation. In many states the examiners are required to issue certificates to candidates who have passed an examination "satisfactory to them." This does not mean that they shall give this examination themselves, but if given by some other Board satisfactory to the State Board, the State Board can recognize it.

But we should go one step further. Much has been said of late years, about the relation of pharmacy and medicine, and there is a deplorable tendency among a great many pharmacists, and even in some associations, to take a hostile position to medicine. This is wrong professionally, and foolish from a business standpoint. The salvation of pharmacy can only rest in the professional part, and in order to remain a profession it must be the intimate friend of medicine. Antagonism between the two professions is as useless as it is senseless. For this reason both professions should work in harmony with a national Board, and instead of having one National Board of Pharmacy and one National Board of Medicine, there should be a National Board of Medicine and Pharmacy, consisting of prominent pharmacists and physicians from all over the country, each branch conducting their special examinations separately, but under a general joint supervision. In this way professional pharmacy will be recognized. Every candidate who will present himself before the proposed medical board must be a graduate of a medical college. In the same way pharmaceutical candidates should be graduates of recognized pharmaceutical colleges, and no pharmaceutical college should be recognized unless the students are graduates of a high school. Pharmacists holding diplomas from such a national board would be recognized as peers by all physicians, and their pharmacy would be patronized by the better class of physicians in preference to others. It will not do to brush this idea aside as it has been before by saying "all this is against the constitution." It might be well for pharmacists to look deeper into our national constitution and find in it higher aims that at present appear impossible, but will certainly come in

the future. The more we read the Constitution of the United States the more we must admire the wisdom of its framers ; for while the rights of States as compared with the rights of the national government are strictly outlined and defined, it does not put an impenetrable enclosure of iron around the structure, and allows for possible changes. We all know that amendments can be made ; amendments of such far-reaching nature, one growing out of the other, that may seemingly oppose the fundamental ideas of the structure. There is at present a growing tendency to demand such amendments in reference to questions that thirty or forty years ago would have been considered impossible. The question of powerful trusts and business combinations seems to demand national legislation that if considered by itself would certainly be strictly opposed to the sense of our Constitution ; and no one can tell how near the time is that such radical changes will be made and endorsed by a two-thirds majority of Congress and three-fourths majority of States. Thus it may be with national boards of various kinds, and it is good and wise if the pharmacists of the country be prepared for such work and take a pronounced part in its execution. National boards are bound to come, and they will come. Let us not lag behind as we have done in other matters. Consider the difficulty under which we labor now to get for our representatives in the army and navy a proper standing, while the physicians rise to almost the highest ranks there. There was a time when the physicians fought for this recognition, and if the pharmacists of those days had been awake and recognized their opportunity they would have joined hands with the physicians and be in quite a different position now. Let this experience be our guide, and let us join those who are our natural allies, and on whose good will and support so much depends for us whether we like it or not.

It seems to me that this Section should recommend to the Association to appoint a committee with the view of acting in harmony with a similar committee appointed by the associations of physicians.


Mr. J. Newton Roe being called upon, stated the substance of the following paper in a few words, and the paper, on motion of Mr. Ebert, was referred for publication :

CONSISTENCY IN EDUCATION AND LEGISLATION.

BY J. NEWTON ROE.

The attitude of the American Pharmaceutical Association upon the subject of Education and Legislation is a matter of more importance at this time than at any other. It is a well known fact that legislation upon any subject is useless unless the existing conditions are favorable to those who are to obey them.

Much has been said concerning the educational requirements of apprentices and those who enter upon college courses. The writer is of the



opinion that the qualifications for apprenticeship should be the same as for admission to the college course, but henceforth this matter can very safely be left to the labors of the American Conference of Pharmaceutical Faculties. That this Conference will eventually establish some educational requirements for admission to the college course by those colleges which have a membership in the Conference is absolutely certain. Doubtless a certificate of admission to a recognized high school or the equivalent by examination would be sufficiently high for the first few years, although many colleges more favorably situated could have a higher requirement of admission from the beginning. Much can be achieved along this line by the Conference if it is not too dilatory in its action.

Among the other matters which will doubtless be settled sooner or later by the Conference is whether a period of apprenticeship should be made a requirement for the conferring of a college degree. This has long been a debatable question, and many years ago when the first schools of pharmacy were organized, apprenticeship seemed necessary because the courses then offered were entirely didactic. It is the opinion of the writer that in the modern college with its well-equipped laboratories in Operative Pharmacy and Dispensing the period of apprenticeship should no longer be made a condition of conferring a college degree. I do not desire to be understood that I would undervalue the period of apprenticeship, but I would leave this matter entirely with the individual and the various State Boards of Pharmacy so far as it affects legislation. Colleges of medicine, dentistry, law, and the various institutions of technology, have adopted this method, and it seems to the writer to be more in keeping with the dignity and function of the college.

The subject of weights and measures is an important one, and in particular upon the eve of the issue of the Pharmacopœia of 1900. The Metric System which is recognized and used in the working formulas of the Pharmacopœia should have the units used expressed with such contractions as are consistent with the contractions of the units used in other scientific, as well as commercial branches.

If Gm. is the contraction for gram, what contraction consistent with this should be used for milligram, kilogram, etc.? Certainly for milligram it should be mgm. and for kilogram Kgm., both of which are very awkward to express in writing. The writer suggests as a basis for the contractions of all units in the metric system the following: That all principal and lower subordinate units in any scale make use of small letters only and that of these the first letter in the name of the principal unit be used, and for the lower subordinate units, the first letter in the name of the unit from which the subordinate unit is derived preceded by the first letter of the prefix, thus, g. for gram, dg. for decigram, cg. for centigram, etc. For the higher subordinate units two letters could be used as in the case of the lower subordinate units except that the first letter should be a capital,

thus, Dg. for dekagram, Kg. for kilogram, etc. For the contractions of units of surface and solid measures the modification of the contractions for the linear units can be made by placing the figures 2 or 3 as an index after the linear unit contraction, thus, m² for square meter, m³ for cubic meter, cm² for square centimeter, cm³ for cubic centimeter, etc. By this method l. would be the contraction for liter, and ml. the contraction for milliliter. The latter, which is the equivalent of a cubic centimeter in volume and being a unit of fluid measure, should be used instead of cubic centimeter, improperly applied to fluid quantities in the past.

The writer suggests that such an important matter as this should be referred to the Weights and Measures Bureau by this Association in order that some ruling that would be official may be obtained. The ruling once made would serve as legislation, and thus the manner of expressing metric values for scientific, commercial and statistic purposes would be unified in the future.

THE CHAIRMAN: Now we have a paper by Mr. Otto A. Wall, of St. Louis, on "Lantern Slides." It is a paper that has required a great deal of trouble, work and expense. Mr. Wall has sent to the Section a lot of lantern slides, to be presented at this meeting. I am sorry that the time is so limited that they cannot be exhibited in detail. The slides are hand-painted. After the adjournment of the Section the members are invited to come forward and examine them. Without objection, this paper will also be referred to the Publication Committee.

MR. WHELPLEY: I believe this paper of Mr. Wall will interest every member of the Association who has any lantern-slide work to do. I will ask you to carefully read it. It is a practical paper, and gives the results of almost a lifetime's work along this line.

The following was the text of the paper in full :

LANTERN SLIDES.

BY OTTO A. WALL, M.D., PH.G., ST. LOUIS, MO.

The chairman of the Committee on Pharmaceutical Education and Legislation suggested to me that a paper on lantern slides might prove of interest, and I gladly comply with his suggestion.

I have found the use of the projecting lantern so advantageous that I hope I may suggest some point or other that may help others in this kind of work. To use the lantern conveniently and to make lantern slides is easy after one has acquired certain knacks, or little tricks, which make success almost sure, while a lack of knowledge of these knacks leads to failures and to much unnecessary work.

The making of lantern slides from actual specimens, from cuts and engravings in books and periodicals, from photographs, charts, diagrams, tables, etc., is so easy when learned that every college of pharmacy ought to be provided with a dark-room and the simple and inexpensive appliances necessary for the work. In every class there are probably quite a

number of students who know something of amateur photography, or some who could be shown how to do such work. A few hours' work now and then would soon add scores of slides to the illustrative paraphernalia of the college. What can be done thus is shown by the slides accompanying this paper, made by two lady students of the St. Louis College of Pharmacy, neither of whom knew how to develop a photographic plate a half year ago.

By the methods explained in this paper slide-making becomes simple and certain, and even though the making of negatives, or at least the arranging of specimens to be photographed, may have to be done by the teacher, the developing and subsequent making of slides can be done by the volunteer help of some of the students, who would be glad to do this work for the sake of learning how to do it.

SIZE OF SLIDES.

It is customary to have all lantern slides of the same size, $3\frac{1}{4}$ by 4 inches (American style). This size should be adhered to, so that purchased slides, or slides obtained by exchange, may be used in connection with those of one's own make. But it is also customary to use all slides in a horizontal position, so that a picture whose greatest length is in a vertical direction must nevertheless be reduced on the slide so that its greatest length must be within the smallest dimension of the glass plate of the slide. Screens usually are square and lenses are round, so that it seems unnecessary to show all vertical pictures on a smaller scale than horizontal ones. I have always made my vertical slides as large as the horizontal ones, and with the longer direction of the opening in the direction of the length of the photographic plate. The only thing necessary to show such vertical slides is to have extra slide-carriers or holders to hold the slides in a vertical position. I show as samples of such vertical slides those of blackberries, the plant mistletoe, the diagram of Rosaceæ, etc., together with the extra slide-carriers required.

FRAMED LANTERN SLIDES.

All my own slides are framed in wooden holders, 5 inches long in a horizontal and $4\frac{1}{2}$ inches in a vertical direction, and all pictures are placed with their vertical directions corresponding to the $4\frac{1}{2}$ inches dimension of the frame. These holders are numbered on the left-hand edge (when held up so as to appear in their correct position); they stand on shelves in numerical order, but are listed in a book both in a numerical order and according to subjects followed by numbers, so that they can be selected for the lecture from the book and then taken from the shelves as easily and as quickly as if they were books on library shelves. The most disagreeable part of a lantern lecture, the sorting and arranging of the slides beforehand, is thus reduced to practically no work at all.

A notch is made on the upper edge of this frame as the slide is held in

its right position ; the lantern operator places the slides before the condensers of the lantern with this *notch down* and *towards the condensers*, and then every slide must show correctly on the screen. The operator needs give no attention to the slide farther than to feel for this notch, and yet he never projects an image upside down or sides reversed on the screen.

The slides showing the members of the A. Ph. A. on the excursion to Graniteville, Mo., on Sunday, the 22d day of September, 1901, show how my slides are framed. I cannot speak too highly of the many advantages of having the slides thus framed. They are easily picked out and arranged for the lectures, and as easily put back in their places on the shelves after the lectures ; a skilled operator is not required to show them, because the notch in the frame makes it practically impossible to show them in a wrong position ; they are not so easily dropped as the unframed slides, which must be put in the holders and taken out again in semi-darkness, while the operator is perhaps flustered by one or more mishaps of having shown slides upside down ; and even if dropped, they are rarely broken, because the frame generally saves them, and moreover, the frame is more easily intercepted in its fall by the foot of the operator.

It costs me ten cents per slide to have them framed, which is surely a trifling expenditure, considering the great conveniences experienced therefrom.

The argument that they become too bulky and heavy is reasonable when applied to the slides of a traveling showman, but it does not apply to slides that do not need to be transported.

LIGHT FOR THE LANTERN.

The best and most convenient light is the electric arc-light, used with an automatic regulator, self-centering and self-feeding. Such an one is in use at the St. Louis College of Pharmacy, and gives great satisfaction, as it requires no attention whatever during the lecture. The carbons are properly adjusted before the lecture, so that the operator needs only to turn on the switch to the lantern and turn off the switch to the incandescent lights in the lecture hall, both of which are in the lantern stand ; after that, any novice can at once show the slides as well as an experienced operator.

Experience has taught us one important precaution ; it has happened that the fuse to the lantern burned out and the lecture had to be interrupted while a new fuse was put in. We now have two connections with the main current, and if a fuse burns out, the switch is turned off and the other is turned on, and the interruption is for only a few seconds. It has never occurred that both fuses burned out during the same lecture.

Formerly we used an oxy-hydrogen burner, but that too was self-regulating, turning and raising the lime automatically by means of a clock-work.

can now be obtained in such convenient and satisfactory form, that it would answer every purpose for college work, or wherever the image on the screen does not need to exceed about 8 or 10 feet in length. The cost of this light is only about five cents per hour.

FIG. 1.

The main point in the choice of light is (next to its being bright enough) that it shall require no attention during the lecture.

As to the size of the image on the screen, I believe a picture about eight feet in size is preferable to a larger one, especially for the kind of slide that is apt to be used in scientific lectures.

CHANGING SLIDES.

In front of my lantern condensers is fastened a frame into which three slides can be put, one above the other. The dotted lines in the sketch indicate the positions of the three slides. The opening in the frame is opposite the condensers and permits the middle slide to be projected. The upper slide is next to be shown, and is brought in view by pulling out the lowest slide side-ways, breaking the fall of the other two, however, with the corner of the lowest one so that the fall is not sudden nor accompanied by a disturbing click.

A frame from one of my lanterns is submitted for inspection in connection with the three framed slides. As soon as the upper slide is brought in view, by being dropped to the middle place, another slide is placed in at the top, to be in turn brought in view on the signal from the lecturer. On the screen, as one picture vanishes by disappearing towards the ceiling, another seems to glide into place by rising from the floor.

Of course this arrangement is best adapted for slides that are framed as already described, but by having three frames or slide-carriers, plain slides can also be shown with it. If both horizontal and vertical slides are used, three slide-carriers of each kind would be required.

This method of changing slides has the advantage that all necessary manipulations can be made from only one side of the lantern, and by one operator.

GUIDES ON PLAIN SLIDES.

If slides are not framed in wood they should be marked in some way so that the operator has a guide for putting them into proper position before the lantern.

There is no uniform custom in regard to such guides and every one is left to devise his own method. On the slide-carriers shown, a red mark

the slide corresponds with the red disk on the carrier ; if the carrier is then put before the lantern *notch down* and *towards the condensers*, the slides are in correct position and the image will appear correctly on the screen.

If the mat between slides is black on both sides, a white disk is more plainly seen. There are, however, many slides in which the mat is white on one side, and in that case the guide disks should preferably be of some pronounced color, and red is most easily seen in the semi-darkness in which the operator must work.

NEGATIVES FOR SLIDES.

To make good slides it is necessary first to make good negatives. To make these of drugs or botanical specimens, which often have a uniform surface-color of non-actinic character (reddish, yellowish, greenish, brownish to almost black), requires special manipulation and a special, although quite inexpensive apparatus.

FIG. 2.

My apparatus consists of a wooden upright frame carrying a plain old-fashioned "Anthony" box camera, without swing-backs or rising fronts, or any other modern attachments, except that the original wet-plate holders have been replaced by holders for dry plates. As no adjustments of back or front are ever required, such a rigid box is really better for this purpose than a modern form of camera.

Everything about this apparatus may be cheap except the lens. A $\frac{1}{2}$ -size Darlot portrait lens will do excellent work and can be bought for \$20, or less ; this same lens is also a most excellent objective for the lantern, so that one lens can be used for making the slides and for projecting the same. A better lens will do better work, of course, and as such an investment needs to be made but once in a life-time, the better lens will prove cheapest in the end.

As shown in the sketch, the lens points downwards and the camera can be moved up or down, and is fixed at the proper height by a peg put in a hole. There are no expensive rack-works for raising and lowering, nor for centering, because they are not needed.

inches long and $2\frac{1}{8}$ inches wide. The image on the ground-glass must be within this limit. I place the object to be copied or photographed on a board below the lens, raise or lower the camera until the size of the image is approximately correct, then support the camera with the peg in the hole. Coarse adjustment is then made in the usual way, by drawing up or lowering the back part of the camera with the bellows; this part of the camera is fastened with a binding screw. The fine adjustment is then made with the rack-work on the lens.

I do not allow the image wanted to be longer than the 3-inch guide nor wider than the $2\frac{1}{8}$ inches, as a rule. If at 3 inches length the width is more than $2\frac{1}{8}$ inches, I make the image shorter. The widest mat I ever use is $2\frac{3}{4}$ inches wide, and the image ought not to touch the edges of the mat, except in the case of drawings and engravings, and I always let the longer dimension of the object to be copied be in the direction of the greater length of the plate. The guide is such that if the image falls properly within its limits it will be approximately correctly centered on the negative.

The centering of the image on the ground-glass is done by moving the object, or the support on which it lies or is fastened.

Instead of a focusing-cloth I use a little box, open below and with a peep-hole on top, and blackened inside. The sketch shows it standing on the ground-glass, over which it fits with its open end; it is much more convenient than a focusing-cloth.

Drawings, cuts from books, photographs, etc., offer no difficulty; they are laid flat below the lens and kept in that position with weights, clamps, or in any other way that may be necessary. Care must be taken that none of these things show within the limits of what it is desired to copy, and that they cast no shadow over any part that is to be copied. Loose cuts, charts, engravings, tracings, photographs, etc., are best put in a large photographic printing frame, under glass. Books are often best kept open and flat by laying on them a heavy piece of plate-glass.

To photograph drugs or botanical specimens this apparatus is set on the floor near a window exposed to the reflection from a bright sky, but not in direct sunlight. I prefer a southern window, but do not often work near the noon-hour. All other windows should be darkened by drawing down the curtains, so that there may be little or no diffused light in the room except that produced by this one window. The objects to be photographed are arranged on the proper background and focused; the illumination is then regulated by turning the whole apparatus, without disturbing the object or focus, more or less direct or oblique to the light, or a little nearer or farther from the window, as may be required, the effect of the illumination being best determined by observing the image on the ground-glass.

Pains should be taken to have the important botanical or pharmacognostic details shown to best advantage before making the exposure. Too deep shadows, especially in very dark-colored objects, can be relieved by fastening a piece of white cardboard against the frame of the stand to reflect back the light from the window on the object; but too much or too generally diffused light, as from skylights or from other windows, will give flat and insipid results in the negative. The slide showing black cohosh (which is almost black) shows what can be done by proper illumination in getting negatives with good contrasts, good high lights and clear shadows from such unpromising material.

As a rule, the best effects are obtained by having the light fall at right angles, or nearly so, across the most prominent protuberances, such as ridges with corresponding wrinkles, venation in leaves, etc. I am in the habit of letting the light fall from the left-hand upper corner to the right-hand lower corner, or obliquely across the object from the left downwards, and vary this only to the extent necessary to get the best effects. It is more pleasant to have it appear on the screen as if the light is uniform, than to have the shadows now on the left, then on the right.

BACK-GROUND.

The color of the object determines, to some extent, the choice of the back-ground. Very light or nearly white objects often give best results by being placed on yellow or brown card-board. Compare the slides of cuttlefish-bone and bleached ginger with that of black cohosh. Nutmeg was laid on Manila wrapping paper, and the gray back-ground on the slide brings out all the more prominently the lime adhering to the drug. We may produce an almost stereoscopic effect on the screen by giving proper attention to the shadows produced by the objects on the back-ground, as may be seen in the slides of nutmeg and colocynth.

A better and even more nearly stereoscopic effect is seen in the slides of henbane, poppy capsules, calamus and the drug mistletoe. The images seem to stand out at some distance in front of the screen, and the light appears to pass between them and the surface of the screen. The darkest part of the image of the object is not immediately next to the darkest part of its shadow, and thus there is given a quite realistic relief or roundness to the image. The back-ground for this effect is a thick piece of plate-glass in a large printing-frame, with a piece of white card-board underneath it. This effect may be increased by removing further from the window, as was done for the slides of mistletoe (drug) and henbane, or it may be reduced by bringing nearer the window, as in the slides of calamus and poppy capsules.

Diagrams, tables, odd orders, illegible prescriptions, etc., are well shown as light lines or figures on dark ground ; in other words, the negatives may be mounted as slides. When such objects are copied from the originals, or from books, the negatives are of course reversed, and when the slides are used plain (that is, not mounted in wood), they cannot be finished to match positive slides ; if a mat is used, as in my sample slides, they seem to be reversed, and will probably cause trouble to the operator, even when the guide is pasted on properly. It would be better to finish such slides with a plain black mat and not show any white between the glasses.

If, however, the negatives are made from drawings, tracings, etc., and not from the originals, I make negatives that are corrected and not reversed, as in the two slides of odd orders and the diagram explaining botanical structure of aconite. This may be done by taking fine ground-glass, rubbing the mat surface with thin tragacanth paste and drying ; this surface will then take Higgin's Water-proof India Ink very well, and on this surface I trace odd orders, prescriptions and similar things. In the drawing of aconite the whole surface within the outlines of the roots was shaded with lead pencil. When the writing is dry this ground-glass is laid *face down* on white card-board ; in this way the negative will read correct and may be finished to match other slides.

As it is difficult to center absolutely correct on a negative, I make this kind of negatives on 4 x 5 inch plates, and cut down to 3 $\frac{1}{4}$ x 4 inch sizes afterwards ; in this way my slides are perfectly centered. If slides are to be framed in wood, this latter precaution is not necessary. For my own use I prefer rather weak negatives as slides, and if they are developed too dense, I reduce in the cyanide solution.

POSITIVE SLIDES.

FIG. 3.

For making positive slides I use a little board frame about eight inches wide and ten inches long. Near one end of this is a shallow depression to receive a 3 $\frac{1}{4}$ x 4 $\frac{1}{4}$ inch photographic plate. I made this depression by cutting a hole a trifle larger than the size stated out of a piece of card-board of about the thickness of a thin photographic plate, glued this cardboard on the wood and covered the front by glueing over it some black velveteen, pressing the fabric closely into the depression in the pasteboard. Two spring clips are so attached that they can hold a plate in this depression.

When about to make a slide I place a plate film-side up in this recess, place over it a negative film-side down) or film to film), being careful to

center the image over the plate for the slide, for it is not always properly centered on the negative ; then the plates are both held in proper place by the clips.

EXPOSURE.

The exposure is simple and uniform. A small alcohol or Bunsen flame is kept burning in the dark room ; this flame is non-actinic, but to make sure, a small partition prevents the little light from this flame from reaching the part of the dark-room where I handle the plates. I have handy a paper box with a lot of bits of magnesium ribbon about 3 Mm. long ; I impale one on a needle in a wooden handle, hold my plate with negative at the proper distance from the flame and ignite the magnesium ribbon at the flame, removing it a trifle from the flame as soon as it ignites to get the brightest effect. If left in the flame, there is not enough oxygen to get the best light.

The average distance for the plate from the light, with a good negative and the plate I use, is about four feet ; when the negative is dense this distance can be reduced, and with weak negatives it must be increased. Of course, some judgment becomes necessary in this respect, but the conditions of exposure are so uniformly simple that nearly every plate comes out right ; I think the sample slides, made by novices at this kind of work, are proof of this. Over-timeing is practically impossible.

SLIDES FROM LARGER NEGATIVES.

For reducing, the same apparatus and stand already described are used. The stand is placed horizontally ; instead of the board which is laid across the two bars making the foot of the stand, a box blackened inside, with the bottom away from the lens, and with a hole cut in the bottom in which the negative can be held by spring-clamps, is placed so that the lens points into the upper end of the box. The hole for the negative should be so cut that the center of the negative falls on the center of ground-glass, and that the length of the negative is also in the direction of the length of the ground-glass. I use for this purpose 4x5 plates, but make the image of lantern-slide size ; then afterwards I cut down the 4x5 plate to $3\frac{1}{4} \times 4$ and so get my picture perfectly centered on the slide. The negative should be placed film-side toward the camera, and be illuminated by a screen of white paper stretched on a frame and placed a few feet back of the negative, and where it is *evenly* lighted by bright sunlight. The box prevents the side of the negative towards the lens from being illuminated, so that all the light falling on the plate in the camera is light that has passed through the negative. A small board laid from the top of the camera to the top of the box, over which a focusing cloth is hung, makes practically a bellows between the lens and the negative, and insures finer slides.

A good method of illuminating the negative is to tilt the whole apparatus toward a bright sky (but not direct sunlight) ; the peg should be put in

the proper hole toward what is ordinarily the top of the stand but what for this use has become the bottom. This prevents the camera from slipping down and getting the image out of focus.

ENLARGING.

Enlarging to lantern-slide size from smaller negatives may be done in precisely the same way. Instead of a long camera, I have a rigid box extension which fits in the place of the ordinary lens board and flange. On the front of this box is a lens flange into which the lens is screwed. This lengthens my camera about six inches and is far cheaper and better than a bellows extension; the length of course can be varied according to requirements, or several such boxes of different lengths could be made. I also use this extension when a cut or illustration is too small in print and I want to enlarge it so as to make a negative of proper size for a lantern slide. For enlarging, the time of exposure must of course be considerably lengthened.

COLORING SLIDES.

Formerly I colored my slides with oil-colors and sealed with Canada balsam; especially is this the case with my art slides, with which some of those present are familiar. But the process is tedious and the results somewhat uncertain, so that more recently I have used mainly water-colors, as in all the colored slides submitted herewith as samples. These slides are colored with "Revoli's Photo-Tints" and "Acme Transparent Water Colors." The colors are used as stated in the directions with the boxes in which they are bought, but thinned very much with water, and the surface of the gelatin film is gone over with quick strokes to avoid lines. Depth or intensity of color is obtained by going over the surface a second, or even a third time, with the diluted colors, as may be necessary.

This work is very simple. An examination of the slides of colocynth, poppy capsules, nutmeg, etc., will show that a uniform simple tint was put on; the shading is in the photograph, not in the color. Even when some little shading with colors was necessary, as in the slide of blackberries, the diagram of Rosaceæ, the slides of roses, etc., it is of the simplest kind, and requires but little skill and time to produce right fair results.

Sometimes a slide which is too poor to use as a plain slide may be made serviceable by a little tinting, as is shown in the weak slide of a diagram of the Rosaceæ and in the very poor photograph from a poor cut (intentionally under-exposed and under-developed) showing "gathering cork." In this slide the plain photograph is so poor that it could hardly serve as a slide, yet the colors have made of it a good slide.

After a slide is colored and the film again thoroughly dried, I rub over the surface with a soft rag and vaseline, leaving but the faintest trace of vaseline on the surface. This adds to the transparency of the colors. Or the slides might be sealed in balsam in the usual way, if preferred.

FINISHING THE SLIDES.

When the slide is finished as far as the picture on it is concerned, I place over it a properly-cut mat of paper that is dark-colored on one surface and white on the other ; the dark side goes next the film, and on the white side the name of the drug or other information may be written. Then I cut off from the ends, or from one end having most glass to spare, enough to reduce the slide to 4 inches in length, place over the mat a clean cover-glass $3\frac{1}{4}$ by 4 inches in size, and bind slide and cover together with "Dennison's Gummed Lantern Slide Binding."

PLATES AND DEVELOPING.

Much if not most of one's success in this work depends on the plates. For photographing from engravings, photographs, or from botanical and pharmacognostic specimens, I prefer Carbutt's "New Process Plates," $3\frac{1}{4} \times 4\frac{1}{4}$ inches in size ; the extra $\frac{1}{4}$ inch of glass I cut off when the slide is finished, as just stated. These plates are made in Philadelphia. I prefer these plates because they are on thicker glass than regular plates for lantern slides, and the glass is better annealed so that slides are not so easily broken. They work slower and can be more easily developed by an amateur. They are not readily over-exposed, and even an under-exposed plate will come out of the developer better than other plates under similar conditions ; the range of exposure may be greater, that is, errors of judgment in length of exposure are not so fatal to good results as in other plates. The same plates can be used for both negatives and positives, so that one needs become familiar with the manipulation of only one kind of plates. The plates do not readily fog, and they suffer little or nothing from halation. The film is tough and will stand reducing and washing well. It works with good contrasts, making good negatives from difficult and unpromising objects. The slides have good clear lights and deep yet clean shadows, and finally, the film takes the colors well.

DEVELOPING.

The plates are accompanied by full directions in each box, but I have had my best success with the following developer (I take for granted that photographic manipulations are understood) :

ALKALINE SOLUTION.

Potassium carbonate.....	30 Gm.
Sodium carbonate, clear crystals.....	30 Gm.
Water, distilled, q. s. ad.....	500 Cc.

BROMIDE SOLUTION.

Potassium bromide	5 Gm.
Water, distilled	50 Cc.

These two solutions can be kept as stock solutions.

To make developer dissolve 4 Gm. of sodium sulphite, crystals, in 150 Cc. distilled water, add 0.65 Gm. eikonogen and 0.35 Gm. of hydroquinone. When dissolved, add 30 Cc. of alkaline solution and 3 drops of bromide solution. This is enough developer for a 4x5 inch developing tray (glass or rubber preferred), and will suffice for about 10 plates. Freshly mixed developer is best for dense lines and clear lights, as in copies from engravings, etc.; for softer effects I use one-third of old developer and two-thirds fresh developer. When done with work, I pour the developer into an amber-colored bottle labeled "old developer," and keep in a cool place. It will stay good for several days in case old developer is needed.

FIXING SOLUTION.

I use the formula furnished with the plates, as follows:

Dissolve 60 Gm. sodium sulphite, crystals, in 180 Cc. of water; mix separately 4 Cc. sulphuric acid with 60 Cc. water; dissolve 500 Gm. sodium hyposulphite in 1500 Cc. water; dissolve 30 Gm. chrome alum in 250 Cc. water. Add the solution of sulphuric acid to the solution of sodium sulphite; add this mixture to the solution of hyposulphite, and finally add the solution of chrome alum; mix and filter.

REDUCING SOLUTION.

If a negative or slide is over-developed, too dense or fogged, it may generally be made serviceable by laying face up in a tray containing enough of the following solution to cover it:

Potassium cyanide.....	5 Gm.
Tincture of iodine.....	10 drops.
Water	1000 Cc.

Label: POISON.

When the photographic film has been reduced enough, wash thoroughly.

WASHING.

Plates should be washed thoroughly after developing, as well as after reducing, to remove the hyposulphite from the film. After they are sufficiently washed, the surface of the films may be cleaned with a pledget of wet cotton and a final rinsing with distilled or filtered water, after which the plates are set on edge in a rack and dried.

SAMPLE SLIDES.

Nearly all of the slides accompanying and illustrating this paper were

made from my negatives by Misses Adelaide C. Boefer and Carolyn A. Burkart, Senior students of class '03, St. Louis College of Pharmacy. It is the wish of the young ladies that after the slides have served to illustrate my paper, they be handed over to Prof. Remington, to be added by him to the collection belonging to the Philadelphia College of Pharmacy.

Most of the slides are self-explanatory. The photo-micrographs are from wet-plate negatives made by me in 1878; at that time no one in this country used the metric system in lectures, and the scale therefore is old style, $\frac{1}{2}$ th inch divided into hundredths of an inch. I believe I was the first one to use such scales on lantern slides. For good photo-micrographs we need clean and *very thin* microscopic preparations; see, for instance, the slides of the two sections of Cinchona bark. These negatives were made with the apparatus described in my "Notes on Pharmacognosy," except that direct sunlight was reflected into the apparatus for the wet plates, where now I use an acetylene flame for dry plates. In the course of time my wet-plate negatives have become paler, and the slides are therefore not as good as might be desired.

The slides of drugs represent a variety of pharmacognostic specimens, most of them colored, as of roots, rhizomes, tubers, twigs, leaves, fruits, seeds, etc., merely to show the possibilities of illustrating from such diversely colored objects.

A slide of R and Jupiter symbols, a slide of a diagram explaining botanical nature of aconite, and two odd orders, illustrate the use of negatives as slides.

The diagram of Rosaceæ and three cases of reversion of type in roses illustrate "atavism" in plants, while the slide of Euphorbium, with the bases of the upper leaves simulating petals illustrates "mimicry" in plants.

A slide copied from a wood-cut in "Ancient Pharmacy and Medicine," published by Engelhard & Co., of Chicago, shows Mandragora roots as seen by an artist of the middle ages. Such roots were supposed to be potent love-charms by our ancestors, just as bifid ginseng (see slide of ginseng) is now believed to be by the Chinese. We are apt to think that the ancient artist greatly exaggerated the resemblance to the human body, but I send a slide copied from a photograph of a carrot, and showing more than mere hints of arms and legs, and the pectoral, umbilical and pubic regions of a woman; a slide of a ginseng root in my collection calls for little imagination to recognize a man; while the couple of parsnip roots grown together in a quaint fashion suggest both male and female. These slides show how closely such roots may sometimes resemble the human form, and help to account for some of the old superstitions.

We read in Genesis: "And God said . . . let the dry land appear; and it was so." Among the earliest land that appeared above the surface of the vast ocean of the azoic age, was a small island of solid granite, rising above the primeval waters at a point that is now in the state of Missouri.

This little island remained above the waters during all subsequent geological ages, and it was on the granite of this island that the A. Ph. A. members spent some pleasant hours on Sunday, Sept. 22, 1901; and it was on this trip that Mr. Louis Schurk, of St. Louis, took the views, from the negatives of which I made the slides. On one of them, especially, there is a good Diehl to be admired.

The following papers were read by title and referred for publication:

The Use and Abuse of Proprietary Medicines, by M. I. Wilbert; What Educational Qualifications Should a College of Pharmacy Demand of its Prospective Students? What of its Graduates? by Frank E. Fisk; Narcotics and the Habitués, by E. G. Eberle; Laboratory Teaching of Materia Medica, by Robert A. Hatcher; Pharmaceutical Testing as Part of a College Course, by L. E. Sayre; Moral Responsibilities, by Clement B. Lowe.

MR. EBERT: We have referred a large number of papers to the Committee on Publication. Now we should give this committee some authority to use their discretion in the matter of publication, because we do not know what the papers contain. I move, therefore, that the Section give the Publication Committee authority to either expunge from the papers anything that may be objectionable as coming from the American Pharmaceutical Association—or this Section—or not to publish a paper, in their discretion; and then it may be brought up at the next meeting, when we may have more time for final consideration. It is certainly not good policy for this Association to publish in the Proceedings papers it does not know the contents of, and I think the committee should be vested with this power by a vote of the Section.

THE CHAIRMAN: The suggestion of Mr. Ebert is very timely, I think, and as the gentleman has a paper himself he is quite the proper one to speak, and I voice his sentiments.

Mr. Wilbert seconded the motion.

Mr. Ebert's motion was then put and carried.

THE CHAIRMAN: Now for a few moments Mr. Whelpley will explain briefly the method of making lantern slides, coloring and using them, according to Mr. Wall's practice.

Mr. Whelpley then took up the slides and slide-holders sent by Mr. Wall, and explained the manner of their operation, etc.

THE CHAIRMAN: The next order is new business. Is there any new business to come before the Section? If not, we will now proceed to the installation of our new officers.

Mr. J. W. T. Knox, Chairman-elect, was not present.

The chair called for Mr. Harry B. Mason, the new Secretary, and that gentleman came forward, being greeted with applause as he did so. The Chairman said:

Gentlemen, I have the pleasure of introducing to you Mr. Mason, of Detroit, who has been elected Secretary for the ensuing year. We know he will serve us well and faithfully during the year.

what it can do. Editors are, by the very nature of things, trained in discussing educational problems. They are used to drumming up ideas and getting things before the public, and I hope the committee will discharge its obligations satisfactorily to the American Pharmaceutical Association next year. [Applause.]

THE CHAIRMAN: The Associates are Mr. M. W. Bamford, of Philadelphia; Mr. Caswell A. Mayo, of New York, and Mr. R. B. Gable, of New York.

Mr. Mayo, only, of the three gentlemen was present, and he said :

Gentlemen, the Associates are supposed to do the work and say nothing. We will endeavor to do our part.

The chair announced that the reading of the minutes of this session was next in order, but Mr. Ebert moved to dispense with the reading, and the motion prevailed.

The Chairman said the business of the Section was now finished, and a motion to adjourn would be in order.

On motion of Mr. Ebert the Section then adjourned.

**WHAT EDUCATIONAL QUALIFICATIONS SHOULD A COLLEGE OF
PHARMACY DEMAND OF ITS PROSPECTIVE STUDENTS ?
WHAT OF ITS GRADUATES ?**

BY FRANK E. FISK.

Among topics pharmaceutical, few, if any, more directly concern the student of pharmacy and the various members of college faculties than those suggested by the above head-lines ; and, though much has been said and written upon the two phases of the subject and requirements for admission adopted by the different schools of pharmacy, calculated to exclude those "minus the needful," it is a generally conceded fact, nevertheless, that the problem yet remains to be solved, if the standard of scientific pharmacy be elevated to its proper level.

As to what should constitute the requirements for entering a College of Pharmacy there is naturally a diversity of opinion among the educators in such institutions, each being measured by results of his or her own observation. That a diploma from a grammar or even a high school is of itself insufficient to guarantee one's fitness for the pursuance of the study of pharmacy (or any other scientific course of study) is obvious, because of the varied curriculums of the different schools, not to mention the lax methods and favoritism manifested by teachers, to say nothing of the crattiness of grammar and high school pupils during examinations.

Furthermore, the running of the gauntlet of a grammar or high school curriculum, throws little or no light upon the temperament, disposition,

tastes or adaptability of an individual to the future calling and responsibility of the compounding and dispensing departments of the modern pharmacy.

Of the grammar and high schools of this country it may be truthfully said that they afford abundant opportunities, and where the mental calibre and efforts of the students are in keeping with the same, the results are usually satisfactory, though many of the "fads" (so-called) might well be sacrificed for thoroughness in the more important studies, such as mathematics, geography, grammar, philosophy, chemical physics, etc.

In the opinion of the writer, therefore, Colleges of Pharmacy should demand of prospective students, as a foundation for the study of pharmacy, the *equivalent* of a high school education, which however need not be acquired at a high school, registration as apprentice to the drug business by a State Board of Pharmacy by examination, and an actual apprenticeship of at least one year under a competent person in a pharmacy.

WHAT OF ITS GRADUATES?

Of this phase of the subject we would say in brief that they should require of their graduates their very best effort during the brief period of their college days, in return for which they should receive the combined assistance of the entire faculty, with the best facilities obtainable.

As to what the curriculum of a College of Pharmacy should include there is naturally much difference of opinion among educators in general, as well as pharmacists, and the various factions that are properly included in the medical fraternity, some insisting that, in addition to the recognized studies, viz., theoretical and practical pharmacy, chemistry, botany, pharmacognosy, microscopy, materia medica, toxicology, and the usual laboratory instruction in the various branches, there should be added physiology, bacteriology, therapeutics, and electro-therapeutics, commercial law, medical or pharmacal jurisprudence, etc.

As to physiology and bacteriology there seems little room for question, since the close relationship between the professions of pharmacy and medicine renders a knowledge of both essential in order to fully comprehend the meaning of language with which the two professions are almost inseparably connected; while of therapeutics, electro-therapeutics, etc., it may be said that it is scarcely possible for pharmacists to acquire the knowledge of materia medica that is expected of them, without becoming reasonably well versed in the therapy of same; and, while a commercial course may be and *doubtless is* quite necessary in the every-day transactions of the pharmacy, the wisdom of directly connecting it with the regular pharmacy curriculum is, to say the least, *questionable*.

We are of the opinion also, that, in keeping with the apparent demand for the additional studies above suggested, the length of apprenticeship now usually required be extended rather than abridged; and that ambitious

time thereafter reduced the amount of morphine in the solution, so that in the course of time the quantity of morphine was simply nominal. The druggist had kept a record of the amount less than what was paid for, and he handed back to the customer quite an accumulated sum of money, with the remark, "that now he could, if he saw fit, discontinue the use of morphine, as he had only been taking an insignificant amount for about one month." Apparently the man was gratified; said nothing of the sum of money he was willing to pay for a cure of his evil; took the money and bought his morphine solution elsewhere, and no doubt continued the use of it while he lived.

A man engaged in a business, the bulk of which is done in a few months of the year, during which time consecutive days and nights are passed without sleep, sought the advice of a physician for insomnia induced through above habits. He prescribed an ordinary dose of chloral, to be taken when needed. The habit was growing on him, when he was told of his danger by the druggist, he was appreciative enough, but transferred his trade on this particular prescription to another store. The remainder of the story is too pitiful to be told.

A young prospering business man suffered at intervals with acute pains of some form or other; morphine by injection afforded relief; the time between the spells lessened; the use of morphine increased. The syringe was laid aside, to morphine were added cocaine and chloroform, when the heart became affected, he resorted to whiskey, and he would get on a glorious drunk. The amount of these drugs used by this individual was something extraordinary, and accompanied with it an occasional whiskey spree and other irregular habits, he still lives, and I am told he is cured of the affliction, after a life of this kind of more than four years.

Another reason for acquirement is association. I have a case in mind of a druggist (?), not in Dallas by the way, whose sales of cocaine, morphine, etc., amounted to more on a Saturday night and Sunday than the total receipts of the average druggist for a week. He became addicted, for no other reason than that he continually handled the drug and dealt with those that used it.

A life of shame leads those unfortunates to soothe the mind through the stupefying or exhilarating drug effects, and the habit readily becomes fixed, as little if any resistance is made. Associates are induced by this fallen individual to just try it for once only, they want company in their misery and get it.

Cocaine is most used among the lower classes of society. The habitues fill our insane asylums, almshouses, city hospitals, and the acts they commit as a result of the dissipation, bring them into the courts for crimes and offences of every description, principally disturbance and theft. Even admitting that they do not, as a rule, leave issue, they cause expense and by their presence taint the community of which they are part. The com-

To sum up the matter, laws that prevent the sale of narcotics benefit the public financially and morally. The public must aid by interesting themselves in the observance of the laws. The moral obligations are more forceful than legal penalties, except with the individual who sees nothing but the money in it, and who must be ferreted out and be punished in accordance with the penalty invoked. The doctor must desist from advertising the narcotics, whenever he uses or prescribes them. The secret use of them must be prevented as much as possible through registration of the sale. I do not mean to say that the information shall become public, other than to authorized legal agents; but the fact that the user knows his name frequently appears on record as a purchaser, is sufficient to make him or her stop and think of the affliction, and perhaps in the moments of sound reason gather courage to battle against the use of the narcotic.

LABORATORY TEACHING OF MATERIA MEDICA.

BY ROBERT A. HATCHER, CLEVELAND, O.

Of the three branches into which pharmacy is usually divided, that of materia medica presents the greatest difficulties to the average student. The reasons for this are found in its less frequent practical application and in the methods employed in teaching it. It is sought to overcome the former difficulty to some extent by organizing botanizing classes in the spring and summer. This is only in part successful, since the experience of most teachers has been that the students become less enthusiastic, and the number continuing in the class diminishes as the holidays pass; for there is no gainsaying the fact that the beginnings of botany entail considerable drudgery in learning unfamiliar terms.

The remedy for this difficulty is to be found in more and more attractively presenting the elements of botany, and thus inspiring greater interest in the botanizing classes—for none will dispute the fact that it is easier to learn about a more or less familiar object than one that is a stranger.

It is to the second difficulty, however, that I particularly wish to draw your attention. The method of teaching materia medica has been almost wholly didactic except for the work done in the microscopical laboratory. There seems to me to be no good reason why materia medica should not call chemistry and the chemical laboratory to its aid in rendering the subject more interesting, and, therefore, easier to the student. So impressed was I with this idea that the effort was made during the past winter to have the students test the various drugs for their chief constituents wherever practicable, expecting them to keep laboratory notes to be used in connection with the lectures.

The first few laboratory exercises aroused an enthusiasm far exceeding my highest expectations, but alas! there was a notable diminution of this interest before the close of the term. I became convinced that the fault lay, not with the scheme, but with myself in having failed to render the course sufficiently varied, and having depended too much upon the individual before he had sufficiently progressed to warrant such independence of action.

In extenuation I have only to offer the fact that one must expect some such difficulties in experimenting in a new field, and pressure of work prevented a more thorough development of the course before putting the experiment to a preliminary test. As it thus became obvious that the course must be carefully worked over before putting it into practice, the aid of Dr. Sollmann was invoked.

Dr. Sollmann is professor of materia medica and pharmacology in the medical department of Western Reserve University. It was desired that a course be devised of sufficient variety to keep up the student's interest without sacrificing thoroughness. Dr. Sollmann has had experience in devising an analogous course for medical students, and entered into the plan with enthusiasm. Since last spring, using the experience of the past winter as a basis for things needful and things to be avoided, we have begun a series of practical exercises for use during the coming winter in the Cleveland School of Pharmacy, and just here it may not be amiss to call attention to a fact more or less familiar to all of you who teach, that a laboratory experiment, simple and easy in itself, may not be practical for a class of students, the matter of apparatus being one of no small consideration.

I take this occasion to briefly mention the plan and state that we hope to offer the course in the form of a text-book for use next year after putting it to a practical test. If we can get the work ready, we also hope to introduce one or two other innovations, but for the present wish merely to announce the progress of such work.

The indulgence of this Section is asked in view of the rather incomplete presentation of the subject, but, as previously stated, the subject has not been fully developed, but we trust that we may present the subject more fully at the next meeting of this Association.

PHARMACEUTICAL TESTING, AS A PART OF A COLLEGE COURSE.

BY L. E. SAYRE.

We have no expectation of presenting anything new to members present upon the subject of pharmaceutical testing, but it is assumed that any contribution to courses of study, even though it bring out familiar points to most educators, is not only appropriate for discussion in the Section on Legislation and Education, but will be appreciated by instructors and others who are less intimately connected with instructional work, for ex-

tation. The second is to combine class recitation with laboratory work, the latter being so arranged as to give as great a variety and scope as possible. The third is to confine the work wholly to laboratory practice, according to a scheme which brings into it the principal reactions relating to the testing of chemical salts. There is a fourth class who ignore this part of the Pharmacopœia and pay no attention to it as a part of pharmaceutical education, believing, as many of those of the first class, that a student who has taken and passed in the work of qualitative and quantitative analysis should be fully competent to perform and understand any of the pharmacopœial tests.

claim that passing up on qualitative and quantitative analysis is sufficient to cover the ground, is a false one. The student before entering upon the work of pharmaceutical testing—before he employs those especially relating to identity and purity, should first have taken the courses leading up to it, namely, qualitative and quantitative analysis, otherwise he cannot appreciate nor properly appropriate this especial work as he should. No one can profitably take up the study of details before mastering the general principles of a subject. Students who have had the training in the branches mentioned, are, perhaps, the best to pass judgment upon the proposition. We have had opportunity to consult such students, and their testimony is decidedly in favor of the view that pharmaceutical testing is comparatively unattractive and unprofitable unless it follow a systematic course in chemical analysis, and that this latter is in no sense a substitute for the former. With proper previous training in analysis, the work of testing pharmaceutical chemicals has life and meaning in it. We are quite sure that the mere class-room recitation upon the text of the Pharmacopœia, relating to the subject, is very unsatisfactory and should not be recommended, and a course in pharmacy which pays no attention to it as a special study should be disapproved.

We have had occasion to watch with interest the success of a course based on the second method—a course of ten weeks, two hours a day, five days in the week, being given to laboratory work, and one every other day to class recitation and consultation. Students were given the following substances for examination, in about the order given: Acidum salicylicum, sulphur præcipitatum, bismuthi subcarbonas, hydrargyri chloridum mite, potassii bromidum, acidum hydrochloricum, acidum aceticum, aqua ammoniæ, potassii bitartras, liquor sodæ chloratæ, calcii hypophosphis, glycerinum, acidum carbolicum, spiritus ætheris nitrosi, aqua hydrogenii dioxidi, acidum phosphoricum, antimonii et potassii tartras, sodii hyposulphis, zinci acetat, ferri et quinina citras. The students were obliged to follow the pharmacopœial tests for identity and purity. Many of the samples given out were purposely adulterated and a systematic method of checking each student's work was adopted, as in qualitative analysis. At the end of the course a practical laboratory examination was given and a written review quiz. To illustrate this written examination it might be well to transcribe five of the ten questions given, merely to illustrate the work.

1. Name the most common impurity in precipitated sulphur, give the pharmacopœial test and explain the same.

2. If sodium bicarbonate contain carbonate how does the Pharmacopœia provide for its detection. Explain the test.

3. If bromide of potassium contain 2 per cent. of chloride, show by U. S. P. test and figures how this may be proven.

5. Explain the test for nitrate or nitrite in iodide of potassium (giving the text of the U. S. P.).

In emphasizing the value of pharmaceutical testing we are aware that many teaching colleges will consider the effort in this direction quite unnecessary, but we have been led to the importance of it, and of presenting it here from the fact that there are those, and they are many, who regard such training as not essential to the practice of pharmacy. Such questions are not given, they say, by State Boards of pharmacy, as a rule, and a college course should look especially to passing board examinations. We do not propose to enter upon any argument of defence for the course, believing this unnecessary. But we suggest that our State Boards recognize its importance and do what they can to show this recognition. Furthermore, we believe that all accredited colleges of pharmacy should be required to give this study an important place in its curriculum.

THE USE AND ABUSE OF PROPRIETARY MEDICINES.

BY M. I. WILBERT.

Apothecary at the German Hospital, Philadelphia.

Within the past year or two quite a number of articles have appeared in the current medical literature deprecating the growing use and consequent abuse of proprietary medicines by American physicians. That the use of these preparations is rapidly increasing cannot be denied. But the extent to which this class of compounds has already displaced the official or more legitimate drugs and preparations is not generally known or recognized. As an additional contribution on this subject, the point of view and ideas of a pharmacist may be of some interest to members of the medical profession, and the statement of some facts not seen or recognized by medical practitioners may serve to place a number of these preparations in the position they should properly occupy. It may be well to define what is commonly understood when we refer to, or speak of, a proprietary medicine. This term, as usually applied, covers all drugs and preparations to which any one individual or firm has, or claims to have, proprietary rights, or absolute ownership. It will be readily seen, therefore, that as commonly understood this term is a very broad one, and covers practically all classes of non-official medicinal preparations that are usually advertised in medical and pharmaceutical journals.

During the past ten or fifteen years, these preparations have gradually increased in favor, and their use of late years has assumed huge proportions. According to some of the analyses of prescription files that have been made and reported from twenty to forty-five per cent. of all prescriptions written in this country are for, or include, articles of a proprietary nature. Making a very conservative estimate we would be safe in saying

character. If we look over the advertising pages of some of the medical journals and read the assertions made there as to the curative effects of certain drugs and preparations, we must come to the conclusion that the manufacturers of these compounds, and their agents, are in possession of a fund of absolute and positive knowledge that is never excelled and rarely equaled, even in the writings of the most optimistic teacher of therapeutics.

Such as have observed the ups and downs of proprietary preparations are necessarily surprised at the amount of credulity that must be current among members of the medical profession if they are to believe these assertions of the manufacturers as being authentic and true. In many cases these statements are unfortunately accepted too freely, and the physician after a more or less extensive and thorough trial of a compound finds out for himself that so far as he was able to observe, the manufacturers' claims, to put it mildly, were rather too extravagant.

Those of us who have seen the rise and fall of hundreds, if not of thousands of proprietary preparations, within the past ten or fifteen years, can appreciate the amount of hope and disappointment they represent.

Among the causes that have led to this excessive use of proprietary articles, none have contributed more than the introduction of certain theoretical and laboratory instruction into the curriculum of medical colleges, and the general discontinuance of practical demonstrations in materia medica and pharmacy.

The modern graduate in medicine has heard many excellent lectures on the physiologic action of various drugs, and their therapeutic application. The knowledge that he obtains in this way the student necessarily accepts as being positive, and having accumulated the requisite amount, he expects to go out into the world and diagnose his cases by one or the other of the numerous laboratory methods that have been taught him. Having found out their ailments, he naturally expects to give his patients a certain fixed quantity of a drug that he has been told will bring about a certain result, to cure them. But! There is always a but: he has not only lost sight of individual idiosyncrasies, but he has absolutely no idea as to the physical properties of the drugs or preparations that he wishes to use; he has not made their acquaintance, probably has never seen them; he knows little about their doses and less about their behavior when brought in contact with other remedies, so that when he makes an attempt at combining two or more of them he usually makes a combination that is wonderful and awful in more ways than one. Even if the doses that he intends to give are not positively dangerous, the mixture, if it be one, will probably be unsightly and extremely distasteful to the patient for whom it was intended. After several experiments of this kind is it any wonder that the

in a variety of cases.

Another one of the reasons why proprietary medicines are so extensively used, may be found with the doctor that has been in active practice for fifteen or twenty years. For one reason or another he has gradually discarded the greater number of the drugs he thought he knew about when he began to practice medicine, until his armamentarium has become meagre indeed. The medical journals to which the doctor naturally looks for information or instruction, do not, as a rule, find time or space in their reading columns to discuss matters of therapeutics or materia medica. The average medical journal devotes its space largely to discussions of laboratory methods for diagnosing uncommon and obscure pathological conditions, or to descriptions of complicated and dangerous operations. Information of this kind has a tendency to impress the average practitioner with the idea that he is indeed losing ground and becoming a back number. Is it any wonder then that he freely accepts as true the claims made for new remedies in the advertising columns of these same highly scientific journals?

The results, however, are almost invariably the same. After an extended trial, that consumes numerous dollars' worth of the new medicine, the doctor finds that he has achieved no better results than he could have secured by using more legitimate and better known remedies. In addition to this, the doctor finds that he has lost a considerable amount of self-respect and self-confidence, due to the fact that he has allowed himself once more to be duped or misled by the volubility of a traveling salesman, or the glittering promises of an advertisement.

It cannot be denied that many of these proprietary compounds are really of value, as medicinal agents. This very excellence, however, adds another to the obnoxious features that make this class of preparations so objectionable. Theoretically, or even according to accepted codes of ethics, the cure and prevention of diseases should be above the acquisition of money for money's sake; and while we can hardly expect to be able to live up to this rather ideal moral precept, it would appear as though the exorbitant prices that are usually asked for medicines of a proprietary nature come very near the outer border of really fair and honest dealing. While many manufacturers, no doubt, honestly believe they have discovered something that is of undoubted utility and value, by far the greater number of proprietary preparations are sent out as business ventures, simply for the profit of dollars and cents they may earn for their promoters. It is therefore readily seen why in many cases the manufacturers are not too scrupulous as to the exact wording of the claims made in their respective advertisements. In looking over the advertising pages of medical journals, we find that medical preparations advertised in them may be classified under one or the other of the following headings:

1. Proprietary articles, or compounds having their therapeutic uses, and the doses in which they are to be taken, prominently displayed on the label or the reading matter that accompanies the package.

2. Proprietary articles, that in addition to the points enumerated above, are also advertised in the lay journals, and are designed particularly for popular use.

3. Proprietary medicines that have the complete, and not a misleading, formula on the label; the manufacturer claiming no further proprietorship than the careful compounding of selected ingredients.

4. Proprietary articles advertised and sold under false pretences. The wording of the advertising matter that accompanies preparations of this class, is usually of such a nature that it intentionally misleads the average individual as to the true composition of the article. In addition to this, these compounds usually come under the headings of class one or two.

5. Chemical compounds that are definitely and positively recognizable as such. A true chemical substance is one the composition of which is well known, and for which there are certain definite chemical tests, by means of which it may be recognized or tested as to its purity.

6. Foods, and food products, including such substances as extract of beef, condensed milk, and the immense number of mixtures, composed chiefly of starch and fermentable sugars, that are offered as substitutes for, or as improvements on, mothers' milk for the feeding of infants.

7. Mineral waters. Under this heading we may group all natural as well as artificial mineral waters.

In looking over this classification, and considering the different groups by themselves, we would probably be safe in saying that no respectable medical practitioner would willingly lend his influence to the development of a compound that comes under the heading of class two. Unwittingly he frequently lauds preparations of this class, and in turn is imposed on by the manufacturer, who advertises such a recommendation far and wide.

Compounds that come under the first classification are of special interest, and should be the object of more careful study and thought on the part of physicians; and it is to this class of remedies that the writer would like to call particular attention. It is, perhaps, not generally understood that a number of these compounds, while ostensibly intended solely for use by physicians, are really put on the market to appeal, indirectly of course, to a peculiar desire of the laity for self-medication. The astute manufacturer has discovered that advertising in daily and weekly papers is rather expensive, especially when compared with the results that are obtained. For this reason many manufacturers have branched out into a different method of reaching the public. A careful study of the class of diseases or symptoms that these compounds are intended to be specifics for, will reveal the fact that many of them are to be taken as tonics for that well-known and popular tired feeling, while others are supposed to

be never failing in the relief and cure of chronic conditions that do not ordinarily respond to treatment. Remedies of this class are usually accompanied by full and complete directions for taking them, and also by a more or less complete description of the symptoms and diseases in which their use would be indicated.

As an illustration of how the new scheme of selling proprietary medicines works, let us suppose a typical incident :

The medical practitioner, whether busy or otherwise, is called on by a well-dressed and suave young man, who may or may not be a graduate in medicine ; at any rate he is able to tell a number of good stories or anecdotes, and he tells them very well. The usual practice, after the necessary introduction, is to tell a funny story or two, and then incidentally to call the doctor's attention to the greatest discovery of the age, "Brown's Elixir of Joy," a remedy that has never been known to fail ; it is used by the leading doctors of the country and in all the leading hospitals. The young man usually leaves a number of samples and a supply of reading matter detailing the wonderful cures that have been accomplished. Then to insure his having made a good impression, he tells another good anecdote and departs.

Following the agent comes a patient that does not appear to be very ill, but relates a complicated train of symptoms—just the case to try the new discovery on. The patient departs with a prescription for "Brown's Elixir of Joy, 1 bottle." If it is a wise patient, and most patients are wise to an extent, he will not present the prescription at the drug store, for if he did the druggist would put on a prescription-label and charge the patient full retail price. To obviate trouble and expense, the wise patient simply asks for a bottle of "Brown's Elixir" and saves fully twenty per cent. in the cost of his medicine. In addition to this material saving, however, he also receives a large amount of printed matter, descriptive of the medicine and the diseases it is intended to cure. This reading matter also includes numerous endorsements from leading medical practitioners and the superintendents of representative hospitals and charities.

Having bought and paid for his medicine, the patient takes good care that it does not go to waste ; he usually takes it with implicit confidence in its usefulness, as described on the label or in the reading matter that accompanies the same. Having, as he himself feels sure, been materially benefited, he naturally advises his friend, who appears to be suffering with a somewhat similar disorder, to try a bottle of "Brown's Elixir of Joy" for that tired feeling, being careful, of course, to add that Doctor So-and-so had recommended it to him as a specific in cases of this kind, and that it was used in every large hospital and by all the leading medical men of the country. This same recommendation will in turn be handed on to other friends, all of them being more or less benefited ; providing, of course, that the medicine is agreeable to the taste and has the requisite amount of stimulating ingredients.

the numerous periodicals devoted to nursing, hygiene and other more or less closely allied branches of scientific research. Many of these periodicals not only circulate largely among non-medical practitioners, but they are also on file in the reading-rooms of all the large libraries, where they are freely consulted by all classes and kinds of people. As the advertising pages of these journals are always filled with clear and positive statements of the value of the various remedies, and as the material contained in the reading matter of the same journal is from, or for, the most learned medical men, need it surprise us that many individuals follow the advice given in these advertising pages without consulting their family physician?—or if they do consult him, they will probably suggest, or in some cases even insist, on the line of treatment.

Still another, and sometimes a very active agent for distributing this class of remedies, is the corner drug store. The average druggist will often stifle the promptings of his conscience, as to the right or wrong of counter-prescribing, by advising a patient to buy a bottle of "Smith's combination," or a bottle of "White's Syrup of half the Pharmacopœia," on the strength of their having been used by the leading doctors of the town.

It is readily seen, therefore, how by taking advantage of the comparatively low advertising rates of medical journals, with the subsequent use and recommendation of his preparations by the medical practitioner, the manufacturer is enabled to promote the sale and use of proprietary articles of this class to such an extent that they will insure him a very handsome return on the capital invested.

Preparations that come under the heading of class three, providing they contain the ingredients, and the quantity of the same, that they are supposed to represent according to the published formula, and have none of the objectionable features of class one or two, might be considered as strictly legitimate.

Compounds coming under the heading of class four, whether they have the objectionable features of class one and two or not, should be discouraged, and not tolerated or used by any respectable physician.

Chemical compounds that are recognized as such, and are used only in the compounding of other medicines, or the prescriptions of medical practitioners, do not come strictly under the heading of proprietary articles; the abuse here is largely if not entirely due to the very liberal patent and trade-mark laws of the United States.

Many of these supposed chemical substances, however, have not been carefully studied as to their physiological action or their chemical properties, and for many there is no known way of recognizing them either by themselves or in a mixture. In addition to this, their purity or uniformity is under no control, other than the say-so of the manufacturer. Taking

all these things into consideration, it does not appear to be quite fair that the unfortunate patient should pay into the coffers of a manufacturer profits on something that the manufacturer himself knows little or nothing about, and in the development of which he has spent little thought, or money outside of coining a trade name and fixing a selling price. It will insure a profit of at least 500 per cent.

In this connection it would appear that a more conservative policy in the use and subsequent recommendation of so-called chemical substances would be thoroughly in keeping with a laudable desire for strictly scientific advancement. One requisite at least that should be insisted on is that whether a substance be patented or not, it should not be used medicinally until its chemistry is thoroughly well known and recognized. The possible abuse arising from the present custom of trademarking the names of chemicals which new chemicals are introduced is one that should have the careful attention of representative organizations. This subject, however, is more foreign to the purpose of this particular article, and we will therefore not go into the matter in greater detail.

The next class, foods and food compounds, especially such as are intended for infants or young children, it will, perhaps, be as well to leave to the medical practitioner and his individual conscience. Suffice it to say that starch and fermentable sugars are not usually considered an ideal diet for a young child. Another feature of all preparations of this kind is the fact that, as found in the apothecary's shop, they are very often contaminated with spores of, or even living, micro-organisms, and in some cases insects in different stages of development may be found in them. This is one of the so-called infant foods.

The last, and probably least objectionable class of proprietary articles are mineral waters. But even with this class there are conditions in which the indiscriminate use of a medicinal water could, and probably would, do a considerable amount of harm.

Without commenting further on the merits or faults of the various medicinal compounds as advertised in medical journals, the writer in conclusion would like to call attention to the fact that from the viewpoint of the manufacturer his various methods of securing trade are perfectly legitimate, and no one can raise any reasonable objections to them. Whether or not it is legitimate or proper for a professional man or a physician to virtually become the advertising or sales agent of the manufacturer, the pretense of giving professional advice, for which he in turn receives remuneration, is a subject that should be given more attention in the deliberations of medical societies, with a view of enforcing existing medical ethics.

In the last twenty-five years some interesting changes have taken place in the regulations governing the employees of many large corporations, especially those of some of the large railway companies. The first change which I wish to note was due to an order issued by a railway company that employees were not to drink alcoholic liquors *while on duty*, or visit places where they were sold. This order produced a marked improvement in the morals of the employees of such roads, accidents being less frequent, the rolling stock better cared for, the public better served. The first step having proved so beneficial, a step decidedly in advance was taken by this and other railway companies; the men were forbidden to frequent saloons either on or off duty. There was some resentment shown to this order, as it was claimed to interfere with the personal liberty which is part of the inheritance of every American citizen. The results, however, were so favorable to all concerned (excepting the saloon) that the complainants had but little ground to stand on.

In many other directions there has been a marked improvement in the morals of employees, and this is especially true of salesmen. It is no longer considered an indispensable condition that a salesman must be a "jolly good fellow," part of whose duties are to take the country customer on a round of carousing, ignoring the divine commandment "lead us not into temptation." It has been found that salesmen of high moral character are more profitable to their employers in the long run. In some other directions (and it is not pleasant to say it) there seems to be danger of retrogression. Some of the large manufacturing pharmacists of the country, out of the largeness of their hearts, and a desire to show marked hospitality to their friends and patrons, have on various occasions (and this is said to be notably so at meetings of the American Medical Association) dispensed intoxicants with a lavish hand. It is said that rooms have been rented at the headquarters hotel and supplied with drinkables which were freely dispensed at all hours. The evil effects of such practices are experienced by both guest and host. Physicians are especially liable to the temptations arising from the use of alcoholic liquors, the stress and strain of an active professional life is so great, and the effect of alcoholic stimulants in moderate amounts so pleasant, that not a few cases, before they are aware of it, find themselves bound with chains, which though invisible, are stronger than iron. Numerous cases could be cited to prove the truth of this assertion. In other cases brave efforts have been made to break these chains, and as "out of sight is often out of mind," they do fairly well until temptation is thrust upon them. The evil effect to the host is the danger of himself forming habits which will eventually destroy his usefulness, and cause him to be set aside by his firm as no longer of value. Lastly, we have the evil effects of example. Other firms being

desirous of also creating a like favorable impression (and this is especially so when they are rivals), are commencing to imitate the example already set. The employees of yet other firms (who can not conscientiously push their products in this way) are being unsettled by it, and report to the houses which they represent the necessity of meeting their rivals on their own grounds. It is possible that they speak one word for their employers, and two for themselves. It is sincerely to be hoped that the firms in question will realize that they are "their brother's keeper," and will find better ways of extending their hospitality.

These remarks can be extended to those firms who make it a practice to entertain visiting bodies to their plants by banquets where intoxicants are served. On more than one occasion the condition of some of the visitors has been disgusting to their more gentlemanly brethren.

Another business policy which is open to criticism is the giving of shares of stock in companies controlling proprietary articles to those who shall push their preparations. This opportunity for extra profit leads to the pushing, and endorsement of preparations far beyond their merits. While this may not be an evil of great magnitude as far as the pharmacist is concerned, it may become a very great evil if practiced by the physician. I am told that certain proprietary remedies have been put upon the market in the following way, viz: The detail man who calls upon the physician to interest him in the new remedy, offers to him a book of prescription blanks which the physician is to use in prescribing the remedy. When the physician returns to the manufacturer a certain number of books with the stubs properly filled up, a share of stock is issued to the physician for the services thus rendered. Fortunately this diseased method of doing business has worked its own cure in several cases, for failure on the part of the companies to carry out their contracts has rendered physicians somewhat shy of such modern business methods.

**REPORT OF THE CHAIRMAN OF THE COUNCIL OF THE AMERICAN
PHARMACEUTICAL ASSOCIATION ON THE FUNDS
OF THE ASSOCIATION.***

The investments and the cash in bank belonging to the several funds of the Association, in custody of the Chairman of the Council on June 30, 1902, are as follows:

EBERT FUND.

1 U. S. Bond, four per cent., registered A, 67,880, for.....	\$500 00
1 U. S. Bond, " " " A, 160,603, for.....	100 00
1 U. S. Bond, " " " A, 2,125, for.....	100 00
Three bonds for.....	<u>\$700 00</u>
Cash balance in bank on last report, June 30, 1901.....	\$65 32
Received since then	28 00
Interest from F. T. Co.....	1 75
Balance of cash in bank (F. T. Co., Phila.), June 30, 1902.....	<u>\$95 07</u>

CENTENNIAL FUND.

1 U. S. Bond, four per cent., A, 145,640, for.....	\$1,000 00
1 U. S. Bond, " " A, 160,604, for.....	100 00
1 U. S. Bond, " " 1895, A, 2,127, for.....	100 00
1 U. S. Bond, " " 1895, A, 2,126, for.....	100 00
Four bonds, all registered.....	<u>\$1,300 00</u>
Cash balance in bank on last report, June 30, 1901.....	\$319 15
Received since then	52 00
Interest from F. T. Co.....	7 25
Balance of cash in bank (F. T. Co., Phila.), June 30, 1902	<u>\$378 40</u>

LIFE MEMBERSHIP FUND.

11 U. S. Bonds, four per cent., 1877-1907, registered A, Nos. 173,049, 164,889, 164,185, 150,828, 150,827, 150,826, 145,762, 145,761, 145,639, 185,893, 202,591, each \$1,000.....	\$11,000 00
Cash balance in bank on last report, June 30, 1901.....	\$1,316 14
Received since last report.....	\$715 00
Interest from F. T. Co.....	25 87
Total receipts.....	<u>\$740 87</u>
Disbursements since last report.....	<u>440 00</u>
Increase since last report.....	<u>300 87</u>
Balance of cash in bank (F. T. Co., Phila.), June 30, 1902.....	\$1,617 01
Amount on deposit with Fidelity Trust Company.....	<u>\$2,090 48</u>

*This report had unfortunately gone astray, and a duplicate could not be obtained in time for insertion in its proper place.—THE GENERAL SECRETARY.

ENTERTAINMENTS AT THE FIFTIETH ANNUAL MEETING.

As a fitting adjunct to the memorable golden anniversary meeting of the American Pharmaceutical Association, the social features of the occasion were on a large scale and long to be remembered by those whose good fortune it was to enjoy the hospitality of the Philadelphia pharmacists and their friends.

At the opening of the week, on Monday morning, a large party under the guidance of Dr. C. B. Lowe visited a number of the public buildings, including the famous City Hall which has thus far cost over \$23,000,000 and is not yet completed, the Masonic Temple and the Academy of Fine Arts. In the evening the President's reception took place at Horticultural Hall, which was largely attended and proved to be a truly brilliant affair. After a grand promenade and rendition of some choice vocal selections, refreshments were served in the foyer of the hall.

On Tuesday afternoon Dr. A. W. Miller escorted a party to the Archaeological Museum of the University of Pennsylvania, and later on to the Drexel Institute, both of which visits were much enjoyed.

The combined tally-ho and trolley ride of Wednesday afternoon gave an opportunity for seeing some of the most beautiful scenery in the neighborhood of Philadelphia. Of special value on this trip was the itinerary published in the official program book, a copy of which had been handed each visitor, and by means of which it became an easy matter to note points of interest, historic buildings, etc., along the route, which led past the new U. S. Mint, through Fairmount Park, passing the Washington Equestrian Monument erected in 1897 by the Society of the Cincinnati, and said to be the largest and most costly bronze sculpture in the United States, having cost \$250,000; then along the Schuylkill River, by Mount Pleasant, once the home of Benedict Arnold, along the banks of the beautiful and romantic Wissahickon, past the Dunkard Monastery, Indian Rock and St. Joseph's Convent to Chestnut Hill Park. The arrangements were such that those taking the carriage ride out returned by trolley cars, leaving the return ride in carriages to those who had been compelled to take the cars on the outward trip.

On Thursday morning visits were paid to Independence Hall, Carpenter's Hall, where the first Continental Congress met, Christ Church, and the Betsy Ross House in which the first American flag was made by Elizabeth Ross under the direction of George Washington.

— — — — —

They're here from the New England States
They're handsome and they show well.
Sam Sheppard's come from Boston town,
And Butler's here from Lowell.
From Illinois comes brother Schuh,
Der Deutsche Apotheker:
The soft-voiced Southron's with us, too,
As witness Colonel Baker.

And Beal is here from Scio,
Friend Searby's here from Frisco's town,
And to be quite specific,
We're glad to greet you once again,
Old friend from the Pacific.

Whelpley and Good from St. Louis,
And Diehl, whom we've an eye on;
While Ebert with his war paint, was
At times a roaring lion.
And yet, in saying this, my friends,
It pleases me to tell you
That though his roar is sometimes loud,
His blow will never fell you.

But there are those we'll no more meet,
This grieves and makes us sadder:
It gives us Payne, who now has climbed
The top round of the ladder.
We've Prescott here and Lyons, too,
And Stevens from Ann Arbor;
While Halberg, Hopp and other friends
Are always full ——— of ardor.

We have had papers here galore,
And we have had discussion.
While some popped up and some went off
A regular percussion.
The cutters, they were clean cut up
And likewise were the scalpers;
The paper was discussed and cussed
Presented by Herr Alpers.

The Vet'rans Hancock, Gordon, Sloan
And Sanders from St. Louis,
John Uri Lloyd from Stringtown came,
Perhaps sometime he'll "do us."
There's Shinn and Jenks and Remington,
From this our Quaker City.
These are a host of veterans true,
Including Henry Whitney.

As they're come here from far and near,
What thought, Sirs, can be greater
That hundreds here again will greet
Their famous Alma Mater.
Oh, mother kind, extend your arms
And open wide your portals,
Give to each one a fond embrace,
For are not some immortals?

While the banquet was in progress, the ladies were treated to a theatre party at the Chestnut St. Theatre, where the play "The Defender," was given, and afterward came to Horticultural Hall, where an elaborate luncheon was served to them in the foyer of the hall.

On Friday morning a party under the leadership of Prof. H. Kraemer visited the German Hospital, the Mary Drexel Home and the Eastern Penitentiary.

In the afternoon nearly all the visitors present accepted the hospitalities of the Retail Druggists' Association of Philadelphia and enjoyed a most delightful excursion on the Delaware River, aboard the steamer "Columbia." Here again the excursionists were furnished with a printed itinerary of the trip, calling attention to Cramps' Ship Yards, the League Island Navy Yard, Penn Treaty Park, Fort Mifflin, Lincoln Park and other points of interest. A substantial luncheon and orchestral music added to the enjoyment of the trip.

On Saturday afternoon the delegates and their ladies were provided with railroad tickets to Atlantic City, where Sunday was spent at the Isleworth Hotel. A special entertainment at Young's pier on Saturday evening, followed by a smoker at the hotel, was provided by the local pharmacists headed by Wm. C. Westcott, Chairman.

An account of the entertainments would not be complete without mention of the exceedingly interesting historical exhibition arranged in Horticultural Hall by the special committee on semi-centennial celebration, of which Mr. Geo. M. Beringer was chairman. The exhibit was divided into three sections, as follows :

A. Relics, souvenirs, curios, antiques, old drugs, rare chemical and pharmaceutical preparations, apparatus and fixtures, comprising 184 items.

B. Books illustrating the advance in the sciences relating to pharmacy, portraits of distinguished pharmacists, diplomas, certificates, medals, manuscripts, letters, tickets, etc., comprising 311 items.

C. Ye olde apothecary—portions of a Philadelphia drug store as it appeared in the early part of the nineteenth century, about the year 1812.

A carefully arranged and well prepared catalogue of the exhibition added very much to the value of this remarkable collection.

For years to come the members of the American Pharmaceutical Association whose privilege it was to be present at the fiftieth annual meeting, will recall with grateful remembrance the bountiful hospitality and kindness of the various committees in charge of the many entertainments.

C. C., JR.

REPORT

ON THE

PROGRESS OF PHARMACY.

From July 1, 1901, to June 30, 1902.

BY C. LEWIS DIEHL.

INTRODUCTORY.

AMONG the contributions to the literature of pharmacy that deal with subjects of a general character, one of the most interesting is that of our long-time associate and honorary member, Dr. Frederick Hoffmann, of Berlin (*Amer. Journ. Pharm.*, July, Aug. and Sept., 1901), in which he reviews the work that has been accomplished—or, more accurately, the work that has been endeavored and failed of accomplishment—by the so-called

"International Pharmaceutical Congresses" that have been held at different periods and in different countries since their inauguration during the year 1864. Though well known to those who have followed the transactions and deliberations of these congresses, it is questionable whether one pharmacist in a hundred understands that these had their origin in an endeavor to combat the disadvantages of the constantly increasing manufacture of, and trade in, secret remedies (*nostrums*), and the consequent dangerous evil in medication and pharmacy. At all events, this seems to have been the sole object and purport of a discussion at the annual meeting of a French pharmaceutical society held at Strassburg in August, 1864, the outcome of which was the adoption of a resolution for calling an international conference of delegates of the representative pharmaceutical associations for consideration and action in this matter.

The annual meeting of the General German Apothecaries Association being held (Sept. 14-16, 1864, at Wiesbaden) within a month after the meeting of the French association, the resolution of the French pharmacists was taken into consideration, and a committee consisting of delegates from German, Austrian and Russian pharmaceutical societies, present at the meeting, was appointed to further consider and report a plan for proper and rigid restriction or suppression of the prevailing *nostrum* evil through inter-

national conference. It appears to have been quite incidental that this committee in their report favorable to arranging an international conference, suggested as a further topic for consideration to come, if possible, to an agreement on a uniform strength of the pharmacopoeial formulæ for commonly used galenical preparations of patent drugs, and to units of weights and measures. It will suffice here to say that in accordance and in consequence of the resolution passed at this meeting, the General German Apothecaries Association, and of the North German and the South German Apothecaries Association in 1865, the first International Pharmaceutical Congress was held in Brunswick in 1865, Germany, Austria, Russia, France and Sweden being represented. The second congress was held in Paris, in 1867, and here the United States were represented for the first time. The third Congress was held in Vienna, in 1869; the fourth (delayed by political complications) in St. Petersburg, in 1874; the fifth in London, in 1881; the sixth in Brussels, in 1885; the seventh in Chicago, in 1893; the eighth in Brussels, in 1897, and the ninth in Paris, in 1900. Dr. Hoffmann's admirable retrospect of the transactions at these several Congresses will prove interesting reading and justify his conclusion that they have been characterized by an utter want of success. Quoting freely from his concluding remarks, "In a candid retrospect of these so-called international pharmaceutical congresses, commencing at Brunswick in 1865 and, as it is to be hoped, adjourned *ad infinitum* at Paris in 1900, it cannot but be conceded that they have failed to realize the anticipations once attributed to them and to bring about some practical or tangible results for the consolidation and advantage of pharmacy in the various countries in the course of the evolution through which it has been passing in the ways and byways of medical, sanitary and industrial progress. These congresses have never been international, except in name, either in representation or in numbers, and have more and more departed from their primary and essential aims and objects. Beyond the constantly recurring series of stereotyped questions and futile resolutions, they have accomplished nothing of productive and enduring consequence." Bearing in mind the fact that the initial motive to the creation of these congresses was the "protest of French and German pharmacists against the growing nostrum evil, and the initial stage of the modern industry of pharmaceutical specialties and proprietaries, it may not be amiss to point out the striking fact that the ninth congress, in 1900, after a lapse of thirty-five years, presented the aspect of still indulging in unavailing deliberations, or rather effete and doctrinal problems, while at the same time and place it was confronted by a kindred well attended congress of pharmaceutical manufacturers from twenty-six European, American and North African countries, convened for the purpose of securing for their calling and products (pharmaceutical specialties and proprietaries) a greater legal recognition as one of the substantial and important factors in the industrial, commercial and economic concerns of the world."

that at the International Exposition in Paris in 1855, ten years before the first International Pharmaceutical Congress took place, only five exhibitors of pharmaceutical specialties figured in the catalogue of the exhibition, whilst they numbered about 400 at the exhibition in 1900. At the same time it is significant that the other primary motive for calling these congresses, the desire for the creation of an international pharmacopœia, has met with no encouragement whatever. Every effort made for the realization of this desideratum has so far failed.

The work of revision of the Pharmacopœia of the United States has naturally elicited numerous papers on a variety of topics. Those of a special character, pertaining to individual instances or classes of substances, have been abstracted as far as possible, and will be found in the body of this report. A number of contributions of a more general character have, however, been published, which deserve attention, and among these the following may here be considered. Thus Mr. M. I. Wilbert (*Amer. Journ. Pharm.*, June, 1902), very interestingly describes—

"*The Evolution of the United States Pharmacopœia*," in its passage through the seven revisions that have so far been made, computing and arranging a considerable amount of information into tables that, in a general way, show the contents and scope of the book at the different decennial periods. These tables and the author's comments will be found useful for reference, and must be consulted in the original. His concluding remarks, which concern the forthcoming revision, may however, be with advantage quoted here, as follows:

"That the coming book will prove to be equal if not superior to any of the recent editions of the several European Pharmacopœias, is assured by the scientific character and attainments of the various members of the Pharmacopœial Revision Committee. That the new book will have exceptional merits is doubly assured by the established standards that it must at least equal, if not excel.

"Whether or not it will become a popular book, will depend largely on the action of the Committee on Publication, and mainly on the price at which it is to be sold. Let us hope that, for the sake of advancing the interests of scientific pharmacy in these United States, this committee may see its way clear to publish not only a scientific book, one that the present and future generations of pharmacists may point to with pardonable pride, as depicting the sum total of our present knowledge, but what is also to be desired, let us hope that the Committee on Publication sees its way clear to have the book issued in such shape that it will find its way into every shop where drugs and medicines are either sold or prepared. Let us hope that they will issue a book that will always lie open before the working pharmacist, and be to him a guide and a reference in his daily work;

During the last few years a new method of assay has been introduced which seems well adapted to practical pharmacy. This is the pharmacological assay or estimation of the therapeutic activity of a drug by its effects on the lower animals; and while a certain prejudice exists in some minds against this method, probably due to the innate conservatism of the medical and pharmaceutical professions, Prof. Cushny's conclusions, based upon a comprehensive review of the subject in his present paper, are that the pharmacological assay is a useful substitute for the chemical

which is sufficiently constant and sufficiently exact for therapeutic purposes. In his opinion, it is to be regretted that the pharmacopœial convention did not consider the question of pharmacological tests more fully, for in excluding them from the next edition it not only rejected the only method of assay in many cases, but also excluded anti-diphtheritic serum, which is certainly the most important acquisition to therapeutics in the last quarter of a century. Serum therapy will scarcely be retarded, but the authority of the Pharmacopœia, which continues to include such obsolete remedies as poison ivy and fails to take cognizance of this most important advance in medicine, can scarcely be augmented by the decision.

"*The Standardization of Galenical Preparations*," by chemical methods, also, has been a principal topic. N. H. Martin, in a paper read before the British Pharmaceutical Conference (1901), discusses the question of standardization from the standpoint of the British practical pharmacist. He points out, as has already been demonstrated by others, that the mere determination of the presence of alkaloid in certain quantity is not sufficient to establish the quality of a preparation; the identity of the alkaloid must also be determined. As mentioned in the annual report of a well-known German manufacturing house, speaking of the G. P. tests for the extracts of henbane, belladonna, etc.: "it is quite as easy to adulterate an extract, and yet to satisfy the requirements of the Pharmacopœia, as it is difficult, in many cases even impossible, to demonstrate the fact of adulteration." In the author's opinion, the aim of the compilers of the Pharmacopœia with reference to galenical preparations of crude drugs, should be, in the first instance, to enable every pharmacist to guarantee from his own knowledge the absolute identity of the finished product with its supposed source. In the next place, the simplicity in the processes for galenical preparations should be adopted, and solutions should be made which will present to medicine fluid or solid preparations of the crude drugs, with the least possible splitting up and interfering with the activities of the substances in the precise combinations in which nature has elaborated them in the plant. Then, in every case, the chemical assay should be carried out on the crude drug, and if, in addition, there are certain preparations of such drugs which admit of being standardized, this should be done by a process which would render the identification of the separated alkaloid a certainty. Starting with such carefully identified and assayed drugs, if precise instructions are given as to fineness of powder and general treatment, the preparations of tinctures, extracts, wines, etc., will not vary within limits which will interfere with their usefulness.

H. Wippell Gadd also had something to say on the subject of the standardization of galenicals, his point of view being that of the manufacturer

He divides galenicals into two classes: those that are or can be standardized to a percentage of some definite chemical substance, and those which can only be standardized by physical tests, such as specific gravity and percentage of extractive. Convinced of the value of standardization on the basis of definite chemical constituents, he points out some instances in which the pharmacopœial demands can be complied with only in exceptional cases. For instance, he has not been fortunate enough to obtain a parcel of *nux vomica* beans which contained more than half the amount of strychnine necessary under the B. P. requirements to make a liquid extract containing 1.5 per cent. The recommendations that only belladonna root containing at least 0.4 per cent. of alkaloids should be used for its galenical preparations, cannot be complied with conveniently, because of the difficulty to obtain roots of that strength, etc. With regard to the second class of galenicals, while doubt has been cast upon the utility of their standardization on the lines of physical constants, as a manufacturer, who has adopted these methods for some time past, he can testify to their usefulness as a check on the work of the laboratories. He points out the results obtainable, as well as the difficulties that may be encountered in making such determinations on quite a large number of tinctures, infusions, etc.

An interesting contribution is also that of Mr. M. I. Wilbert (*Amer. Journ. Pharm.*, Feb., 1902) in which he reviews the

"Advances Made in the Practice of Pharmacy During the Year 1901," and briefly describes a number of the remedies that have come into use or that have enlisted special attention during the year. As a decided example of modern progress, he cites the fact that the requirements of the Pharm. Germ. IV, are of such a nature that many German apothecaries have found it advisable to attend short post-graduate courses, embracing work with microscope and the chemical burette. These courses are held in large university towns, and cover about twelve working days. The field of usefulness of the B. P., 1898, has also been extended by the republication and elaboration of the Indian and Colonial Addendum, and this may be considered as the forerunner of the proposed British Empire Pharmacopœia.

In line with Mr. Wilbert's paper is one by Mr. Henry P. Hynson, read at a pharmaceutical meeting of the Philadelphia College of Pharmacy (November 19, 1901), entitled

"Modern Drug Store Methods," in which he evidently discusses the subject from the standpoint of a wide and practical experience that leads him to regard "modern drug store methods" as decided evidence of pharmaceutical progress. It is impracticable to do more here than to recommend to aspiring pharmacists a careful perusal of this paper, but the following quotations may serve to show the author's view concerning modern drug theses: "On and on one may go showing how careful ob-

servation and generous brotherhood have added improved methods and devices of great value ; striking evidences of progress. Not only is this true of one department and regarding very simple things, but it is equally true of all departments, about more exalted doings. Changes have affected every phase of our calling and its practice, and the sooner we recognize these and the advantages accruing therefrom, the better will be our chances of success. If one is skeptical, he may reason the matter out on logical bases. If he doubts the advisability of locating upon a thoroughfare and near the centre of trade rather than, as was formerly desirable, in a more remote, residential district, does he not see that influences wonderful and mighty have been at work to bring this about? The world has grown strangely small, and each one of its subdivisions has grown smaller in the same degree. Does he wonder why physicians congregate in the most advantageous centres, without regard to local practice, as formerly? The telephone has brought it about in two ways, which are quite obvious ; this same influence is soon to be felt in helping to concentrate the pharmaceutical business. The passing of the strictly local drug store, as a drug store, and the increasing trade in side lines, is largely due to the fact that the emergency pharmacy is no longer necessary ; it is replaced by the physician's pocket, largely his hypodermic syringe case, which is often supplemented by the knowledge and forethought of the trained nurse."

Continuing, Mr. Hynson observes that he wishes in no way to disparage the smaller stores, but to sound in all kindness a warning note, and to lend a helping hand. It is only in the enlargement of stores and the concentration of effort that he sees release from long hours and overwork. Higher practice must be had in better stores, not in more stores. If this is not true, it is possible, and will, he believes, certainly follow. "There are many evidences that this is the case already. Where do we find the most desirable and competent assistants? Are they not constantly seeking and finding positions in the larger establishments? And is it not because they are better paid and have more privileges? It is there that their talents and acquirements find a better market, because needed."

These thoughts, so eloquently and tersely expressed by Mr. Hynson, must obtrude themselves when we scan the work exhibited in the abstract from the

Proceedings of the State Pharmaceutical Associations given below. As in previous years, the volumes of "Proceedings" that have reached the reporter's hands are scarcely one-half of those that have been published. He has therefore been compelled to rely largely upon the current pharmaceutical press for collecting the information concerning the work done, this being indicated in the following by an asterisk (thus *) preceding the name of the state.

Alabama.—The Twentieth Annual Meeting of the Alabama Pharma-

King, of Macon, Secretary. Reports of particular interest were presented from the following committees : On Securing Proper Standing of Pharmacists ; On Adulterations ; On Trade Interests, and On Queries. The following papers were read :

“How to Successfully Advertise a Retail Drug Business ” by J. E. Kidd.

“Which is the Best Policy for the Retail Pharmacist, to Manufacture His Own Pharmaceuticals and Specialties, or to Have Them Made?” by Jefferson D. Persse.

"The Sale of Poisons," by Carrie Wood.

"How Can a Druggist's Wife Best Promote Her Husband's Business Interests?" Three papers; by Mrs. W. G. Beale, Mrs. F. Howard, and Miss Lois Stevens.

Kansas.—The Twenty-second Annual Meeting of the Kansas Pharmaceutical Association was held at Topeka, May 21 to 23, 1901. F. A. Snow, of Topeka, was elected President; E. E. Lair, of Topeka, Secretary. An interesting report was presented by the Committees on the School of Pharmacy at the State University, which was supplemented by a report on "New Remedies" (embracing in all 170), by Professor Sayre.

routine reports were presented and discussed, and the following papers were read :

“ Brief History of the Cinchona,” by J. F. Sanford.

“ Cinchona—History, Methods of Cultivation,” etc., by E. T. Bowen.

“ Is the Present U. S. P. Process for the Assay of Opium Satisfactory ? ”
by Forest G. Stanford.

“ Our Customers : How shall we treat them so as to increase their number ? ” by A. G. Gilmore.

Maryland.—The Nineteenth Annual Meeting of the Maryland Pharmaceutical Association was held at Ocean City, July 16 to 20, 1901, in four sessions. Louis Schulze, of Baltimore, was elected President; Owen C. Smith, of Baltimore, Secretary. Important reports were received from the following committees: On Adulteration; on Pure Food and Drug Law; on the Progress of Pharmacy, and on Trade Interests. The following papers were read:

"Practical Suggestions upon the Business Side of Pharmacy," by W. I. Rudy.

"Outlook for the Young Pharmacist in Maryland," by E. T. Reynolds.

"Notes and Jottings," by Wm. C. Powell.

"Need Candidates for Board Examinations be Graduates?" by Henry P. Hynson.

"Acetic Acid as a Menstruum for the Exhaustion of Drugs," by A. R. L. Dohme.

"What to Drop or Add to the Pharmacopœia," by Henry Maisch.

The following topics propounded in the annual list of queries, to which no written answers were received, were discussed verbally:

"Tinctures;" "Elixir Pepsin, Bismuth and Strychnine;" "Tincture of Ferric Chloride;" "Shorter Hours for Pharmacists;" "Hydrogen Dioxide Solution;" "Orexine Tannate Tablets;" "The Metric System."

Massachusetts.—The Twentieth Annual Meeting of the Massachusetts State Pharmaceutical Association was held at Fall River, June 11 to 13, 1901, in four sessions. L. G. Heinritz, of Holyoke, was elected President; James F. Guerin, Worcester, Permanent Secretary. The report of the committee on Sophistication and Adulteration was particularly valuable, embracing a volume of original observations from the Analytical Laboratory of the Massachusetts College of Pharmacy, arranged and presented by Dr. J. W. Baird, and "Laboratory Notes on Drugs and Chemicals Varying from Standard Strength and Purity Observed During the Past Year," by Frederick T. Drake. The Committee on Codification of the pharmacy laws, presented a very interesting report, in which they suggest a number of changes to the present laws, and John H. Manning made a very voluminous and exhaustive abstract from the Public Statutes of Massachusetts of the Laws Relating to Druggists and Apothecaries, Regulating the Sale of Poisons, Adulterations of Food and Drugs, Offences against Public Health and of Chastity and Morality, etc., etc., this portion, including a carefully prepared index, occupying pp. 142 to 219 of the printed Proceedings.

The following papers were read:

"On the Pharmacy and Medicine of To-Day," by Dr. R. W. Greenleaf.

"Pharmaceutical Legislation," by Wm. J. Bullock.

"On the Duties and Powers of the Board of Pharmacy," by Charles R. Hillberg.

States Pharmacopœia ;" "On National Formulary," and "On Legislation."

The following papers were read :

"Some Narcotics," by J. F. Llewellyn.

"Carbon Molecules," by J. F. Llewellyn.

"On the United States Pharmacopœia," by Carl G. Hinrichs.

"Notes on the United States Pharmacopœia," by Gustavus Hinrichs.

"Pharmaceutical Notes," by Francis Hemm.

"The Medicines Prescribed by 108 St. Louis Physicians," by Dr. H. M. Whelpley.

"Compound Extract of Salix," by A. D. Chenoweth and William K. Ilhardt.

Nebraska.—The Twentieth Annual Meeting of the Nebraska Pharmaceutical Association was held at Lincoln, May 7 to 9, 1901. P. Strausbaugh, of Omaha, was elected President; W. M. Tonner, of Randolph, Secretary. An interesting feature of the meeting was a lecture by Prof. Oscar Oldberg.

New Hampshire.—The Twenty-eighth Annual Meeting of the New Hampshire Pharmaceutical Association was held at The Weirs, September 10 and 11, 1901. Herbert E. Rice, of Nashua, was elected President; John U. Marshall, of Manchester, Secretary.

New Jersey.—The Thirty-first Annual Meeting of the New Jersey Pharmaceutical Association was held at Trenton, May 22 and 23, 1901, in three sessions. James Foulke, of Jersey City, was elected President; Frank C. Stutzler, of Elizabeth, Secretary. Besides routine reports, the following papers were read:

"What is the Objectionable Principle in Cotton Seed Oil," by Prof. P. G. Hommell.

"Alcohol Deodoration in Elixirs, Spirits and Tinctures," by Prof. P. G. Hommell.

"An Alkaloid, the Active Constituent of *Collinsonia Canadensis*," by Herman J. Lohman.

"On the Medicinal Value of Condurango," by Prof. P. G. Hommell.

"A Formula for Liquor Ammonii Anisatus" (two papers), by G. W. Parisen and G. E. Thum.

"Are External Applications, Liniments, Ointments and Plasters Prescribed as Freely as Formerly?" by G. W. Parisen.

"The Preliminary Examination of Apprentices," by C. J. Schudde.

"Do Hospital Dispensaries Take Away Any Trade from the Pharmacist?" by Chas. H. Landell.

New York.—The Twenty-third Annual Meeting of the New York State Pharmaceutical Association was held at Buffalo, June 4 to 8, 1901, in six sittings. Thomas Stoddart, of Buffalo, was elected President; Judson B. Todd, of Ithaca, Secretary. Interesting reports were received from the committees on New Remedies, on Pharmacy and Queries, and on Adulterations. The following papers were read:

"Abuses of Proprietary Rights in Pharmacy," by Jos. Helfman.

"A Few Facts About Vaccine and Vaccination," by Frederick T. Tutbill.

"Shop Notes and Dispensing Hints," by W. A. Dawson.

"The Advertising Druggist," by Judson A. Todd.

"The Habitat of Drugs," by Walter Bryan.

2. Experience as to the use of wood alcohol in making tincture of iodine.

3. To what extent are substances used to counteract or improve the odor of so-called purified wood alcohol?

4. Is precipitated calcium phosphate as commonly used up to the U. S. P. standard?

5. Is the aconite root at present on the market pure, or is it contaminated with other roots through faulty collection?

6. Phosphate of soda. Does it contain arsenic in dangerous quantities?

of the ether, or is a new class of preparations indicated?

8. On the use of alkali and acid in certain fluid extracts.

9. Collodion. Cause of undue thickness.

10. White hellebore. Requirements of purity and method of assay.

11. Is the lard of the market reliable?

12. What is the primary cause of the red color developed in carbolic acid on standing? How may it be overcome?

13. Vanillin. Tests for its purity, and advisability of admitting it to the U. S. P.

14. What is the character of the assayed powdered drugs now being placed on the market, and how do they compare with the claims made for them?

15. Can the assay process for estimating quinine in the total alkaloids from cinchona bark be simplified?

16. Practical suggestions for making and keeping laboratory notes in retail drug stores.

"Methods of Advertising by Retail Pharmacists," by H. F. Ruhl.

"Is Alcohol a Stimulant or an Anæsthetic," by D. J. Thomas.

"Analysis of One Thousand Prescriptions," by S. E. R. Hassinger.

"What is the Prime Cause of the Failure of a Large Percentage of Applicants at the State Board of Pharmacy Examinations," by Louis Emanuel.

"Formula for Making Cold Cream," by Theodore Campbell.

"Aniseed Oils and Anethol," by George R. Pancoast, M. D., and Lyman F. Kebler.

"Native Drugs," by Isaac M. Weills.

"Tabulation of One Thousand Prescriptions," by C. H. La Wall and M. N. Bamford.

"Rapid Method of Determining the Value of Chromic Acid, and the Soluble Chromates," by Lyman F. Kebler.

"Should Pharmacists Have a Better Knowledge of Therapeutics?" by D. J. Thomas.

"Laboratory Notes," by Robert C. Purcell and W. R. Graham.

"Oleate of Mercury," by F. W. E. Stedem.

"Deterioration of Artificial Foods," by C. H. LaWall.

"Minor Surgery. Are Druggists Qualified to Attend to Such Work?" by Dr. B. F. Stahl.

"Antitoxin." An Address delivered by Prof. C. B. Lowe.

Rhode Island.—The Rhode Island Pharmaceutical Association held its Semi-Annual Meeting, in the shape of a sail to Seaconnet, on July 10, 1901. According to available information, no business was transacted, these semi-annual meetings being in the nature of outings for pleasure rather than for business.

South Carolina.—The Twenty-fifth Annual Meeting of the South Car-

Ward, of Rutland, Secretary. The following papers were read :

"The Gelatine Capsule," by C. C. Bingham.

"The Money We Use : What is It?" by M. Pierce.

"Camphor," by Dr. J. C. F. With.

Virginia.—The Twentieth Annual Meeting of the Virginia Pharmaceutical Association was held at Elkton, July 16 to 18, 1901, in three sessions. E. L. Robey, of Herndon, was elected President ; C. B. Fleet, of Lynchburg, Secretary, The report of the Committee on Exhibit brought out some

Washington.—The ——— Annual Meeting of the Washington State Pharmaceutical Association was held at Tacoma, August 20, 1901. J. W. McArthur, of Spokane, was elected President; W. O. Bonney, of Tacoma, Secretary.

Wisconsin.—The Twenty-first Annual Meeting of the Wisconsin Pharmaceutical Association was held at La Crosse, August 13 to 15, 1901, in five sessions. E. B. Heimstreet, of Janesville, was elected President; Henry Rollmann, of Chilton, Secretary. The following papers were read:

"Evolution of a Druggist," by T. H. Spence.

"Is it Essential for a Retail Druggist to be a Practical Pharmacist to Make a Success in His Business?" Two papers: by Herm. Emmerich, and Otto J. S. Boberg.

"Explain the Chemical Tests Used in the Work of the Store During the Current Year," by Otto J. S. Boberg.

"Officinal Medicinal Plants of Wisconsin," by ———.

"Prescription and Store Notes," by Geo. E. Mariner.

"What Can the Druggist Sell His Barber?" by C. A. Otto.

"Is the Commercial Cane Sugar Contaminated with Glucose?" by E. G. Rauber.

"Some New Soda Drinks, Give General Hints," by O. T. Erhart.

"Should Every Registered Pharmacist in the State of Wisconsin Become a Member of the Wisconsin Pharmaceutical Association?" by A. B. C.

"My Experience in a Drug Store One Day," by John F. W. Baumann.

"Some Benefits a Retail Druggist Derives from Being a Member of the N. A. R. D.," by J. F. W. Baumann.

"Are Proprietary Medicines Profitable to Handle in a Retail Drug Store?" by E. G. Rauber.

PHARMACY.

A. APPARATUS AND MANIPULATIONS.

Specific Gravity—General Determination.—Robert A. Hatcher, M. D., suggests a simple method of taking specific gravity with the aid of an ordinary box scale, the operation being illustrated by Fig. 1. A beaker containing water is balanced upon the scale, and having weighed the article in air, it is then suspended so that it is wholly immersed in the water, as shown. The weight now required to restore the balance is the weight of the water displaced, from which the specific gravity of the substance is

FIG. 1.



Specific Gravity.

displaced by a solid of known volume calculated as water.—Rep.)—Amer. Journ. Pharm., Dec., 1901, 595.

Specific Gravity—Corrections for Absolute Weight.—Referring to the paper of Dr. Hatcher, Thomas S. Wiegand reminds that in taking specific gravity by the aid of the bottle all the ordinary weighings are approximate only unless the *absolute weight* of the bottle is taken, for all the normal weighings are made in the air and not in vacuo, and the bottle which contains one liter of water will hold 17.7 grains of air, and of course, there is this much less weight to be used as a counterpoise when the bottle is to be used in taking the specific gravity of any liquid; then the temperature at which the liquid is weighed must be taken into account, and this correction must be made for each and every liquid experimented with, as each liquid has its own rate of expansion, and this rate of expansion must be ascertained and the scale for it arranged beforehand. Incidentally, Mr. Wiegand calls attention to the following easy method of taking specific gravity of bodies soluble in water, given in "Ganot's Physics:" Weigh the body in air, then in some liquid, the specific gravity of which has been ascertained, and in which it is insoluble, and multiply its weight by the specific gravity of the liquid, then divide this product by the loss sustained when immersed in the liquid. The result is the specific gravity weight.—Amer. Jour. Pharm., May, 1902, 230.

"Solids by Weight, Liquids by Measure"—*Inconsistencies of the B. P. 1898.*—W. Lyon observes that an examination of the B. P. from the point of view of the unwritten law of "solids by weight, liquids by measure" brings out some interesting and curious results, which he exhibits in a table of some forty-five or six different official preparations. From this it appears as if the compilers had at times thrown aside the law altogether,

Thus, for example, in borax-honey and in oxymel, the liquids are directed to be weighed, but in oxymel of squills the clarified honey is directed to be measured. Numerous similar examples are cited in the table, which is most profitably consulted in the original in *Pharm. Journ.*, Aug. 24, 1901, 275.

Medicine Measures—Adaptation of the Metric Values.—At the pharmaceutical meeting of the Philadelphia College of Pharmacy in November, 1901, two papers were read which deal with medicine measures, the one by M. I. Wilbert, who describes a metric medicine glass, the other by C. B. Lowe, who calls attention to the variations observed by him in the

Capacity of Spoons.—According to the authorities quoted by Mr. Lowe, it would seem that the modern tea-, dessert- and tablespoon are larger by 25 per cent. than the older form, which were supposed to have capacities of one, two and four fluid drachms respectively. Experiments made show, however, that this is not so, some of the older forms having a greater capacity than the more modern ones. Thus eight teaspoons were found to vary from 75 M. to 120 M. in capacity, the average showing 107 M. (about 7 Cc.) ; three dessertspoons had capacities of 3, full 3, and 4 fluid drachms, the last two being 80 and 50 years old respectively ; while of six tablespoons, one a hundred years old, held 4 fluid drachms, three modern ones held each 5 fluid drachms, one 60 years old held $5\frac{1}{2}$ fluid drachms, and the sixth, a modern spoon, held 6 fluid drachms. These capacities apply to distilled water ; when filled with strong alcoholic tinctures they will hold about 10 per cent. less, and with dilute alcoholic tinctures about 5 per cent. less, this variation being due to the fact that the cohesion between the molecules of alcohol is less than that between the molecules of water. Mr. Lowe concludes that, presuming in actual practice the spoons are not to be perfectly filled, the patient would get in the average teaspoon about 50 per cent. more than the theoretical quantity, while in the average dessert and tablespoon this increased quantity would only amount to about 25 per cent. He therefore agrees with Professor Wilcox (White and Wilcox "*Materia Medica*") that the use of accurately marked glass graduates, which can be easily obtained, should be insisted on for the dosage of liquid medicines. Pertinent to this subject is Mr. Wilbert's proposition in favor of the

FIG. 2.

Metric Medicine Glass, shown by Fig. 2. Mr. Wilbert observes that in France and other countries that have adopted the metric system, the teaspoon is taken to be the equivalent of 5 Cc., and the tablespoon is taken as the

Metric Medicine
Glass.

equivalent of 15 Cc., or three teaspoons. This, the author thinks, represents more nearly the approximate relation between a tea and tablespoon of average capacity, and, in addition to this, comes nearer the generally accepted value of capacity for the tablespoon as used in this country at the present time. Such metric medicine glasses are in use in the German Hospital (Philadelphia), and are procurable in the pressed glass and etched variety, the latter being the more accurate and satisfactory.—*Amer. Journ. Pharm.*, Dec., 1901, 590-593-595.

Dose Measures and Measured Doses—Mutual Relation.—M. I. Wilbert has written an elaborate paper in which he communicates the results of his own experiments and experience with dose measures in their relation to measured doses, which may be consulted with advantage in the original. The more important points made are: that all glass measures are graduated correctly only at one point, the intervening graduation being filled usually according to the rule of thumb; that variation in spoon measures, aside of differences in capacity between one and another, are largely due to the fact that a comparatively large quantity of liquid may be heaped upon a full spoon; and that, while drops are admittedly uncertain quantities, it is possible to have a dropper that will be much more reliable than the proposed standard now before the pharmacopœial revision committee.—*Amer. Journ. Pharm.*, March, 1902, 120, 134.

Spoonful Doses—Necessity of a Standard.—In a second paper, in which he handles his subject quite as exhaustively as in his previous paper on "Dose Measures and Measured Doses," Mr. Wilbert discusses the variations in "spoonful doses" and the necessity of establishing some definite relation to absolute quantities of measurement. In summing up his inquiries and the arguments that bear on them, he observes that "the proofs and arguments that have been advanced seem to indicate that so long as doses of medicines are referred to as being spoonful quantities, spoons will be largely used as medicine measures. If spoons are used to measure out doses of active medicines, it must appear that we should, at least, make some effort to secure greater accuracy and uniformity in the quantities that are likely to be administered. For this purpose the adoption of a descriptive definition, indicating the approximate amount that is intended by the term, would appear to offer some possibility of securing the desired results." "As regards the proposed equivalents for tea, dessert, and table-spoonful, it would appear to be desirable that we adopt quantities that will fit in well with the system of notation used in the metric system of weights and measures; and here again, if doses are to be referred to as being spoonful quantities, these quantities should conform as nearly as possible with the actual capacities of the spoons that they are supposed to represent." As to what is meant by a spoonful, of any size,

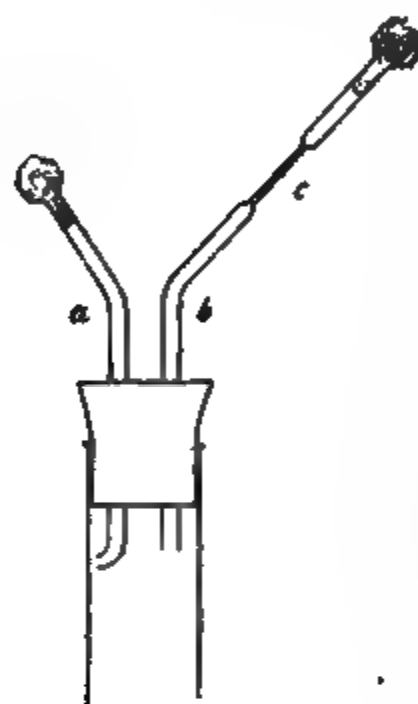
not show a curve above the upper edge or rim of the bowl." The importance of this definition becomes apparent when it is remembered that the surface varies in size according to the difference in the shape and depth of the bowl. Inquiries made among manufacturers of spoons and silver ware by the author seem to indicate that there is a practical uniformity in the actual capacities of the bowl maintained by them for each kind of spoon, but that they vary in style and shape; a wide or round bowl is quite shallow, while a narrow-pointed spoon is generally quite deep.—*Amer. Journ. Pharm.*, May, 1902, 218-224.

Official Medicine Dropper—Problem of Adjustment to a Uniform Standard.—In response to the request of a member of the Committee of Revision of the U. S. P., Oswald Schreiner discusses the subject of an official medicine dropper which shall uniformly deliver drops of a value corresponding to a recognized standard. The difficulties in the way would be easily overcome if we had only a single liquid to deal with, but in practice we have to deal with innumerable liquids differing in their composition and consequently in their capillary constants, so that both their respective volumes or weights will differ from each other when dropped from an identical dropper. The salient points presented in Mr. Schreiner's admirable discussion may be briefly summarized as follows: Under the conditions of constant pressure and rate of outflow the number of drops contained in a certain volume of a liquid is constant, this volume, and consequent weight, being dependent on the size and shape of the dropping surface, and on the kind of liquid; but the actual size—volume and weight—depends on the cohesion of the liquid. Thus a drop of water delivered from the same dropping surface is both larger and heavier than a drop of chloroform, notwithstanding the greater specific gravity of the latter. Furthermore, it has been shown by Eschbaum, that the weight of a drop of a solution of a solid body can practically be considered as equal to the weight of a drop of the pure solvent; a fact which is shown by numerous examples cited in the present paper, and which reduces itself, according to Eschbaum, to a very simple principle, namely: that drops of all aqueous solutions have the same weight as pure water; drops of tinctures, prepared with alcohol, have the same weight as alcohol; or prepared with diluted alcohol, the weight of a drop of diluted alcohol. But, however correct Eschbaum's assumptions may be, his proposed drop system of dosing depending on the definite relation of weight to volume becomes useless when applied to American pharmacy and therapeutics. For all liquid preparations of the U. S. P., with but few exceptions, are made on the basis of volume, and are dispensed on this basis. Consequently the drop must be regarded simply as a commercial measure of volume, and must of necessity be defined in terms of volume. Such a definition will include all liquids, no matter what

their specific gravity or cohesion may be. Let the drop be defined as one-twentieth ($= 0.05$) part of a cubic centimeter, and let the official medicine dropper be one graduated in drops, each drop to be 0.05 Cc. This graduation, it is true, will increase the cost of the dropper, but the author regards a trifling matter to stand in the way of scientific advancement.—Pharm. Rev., July, 1901, 298-303.

Dropper—Construction for Sterilized Fluids.—G. Wesenberg recommends the dropping arrangement shown in Fig. 3 for dropping sterilized liquids and maintaining their sterility. A biperforated rubber stopper is provided with two glass tubes shown as shown in the drawing. The tube *a* is intended for the admission of air, and when use is loosely closed with cotton-wool. The tube *b* is constricted at *c*, the larger outer extremity being also closed with cotton-wool. The contents of the flask or test-tube into which the stopper is fitted have been sterilized. When the liquid is to be dropped, the tube *b* is cut at *c* with a file, when it is ready for use. Its sterility is to be maintained for further use by the constricted end, after heating in the flask, and covered with a small sterilized test tube or cap. It is advisable to maintain the flask or test-tube during the interval of use in an inclined position, not upright, so that the fluid in the tube may be retained in it and not return into the flask.—Pharm. Rev., Feb. 12, 1902, 123; from Centralbl. f. Bakt., 1901, No. 18.

FIG. 3.



Dropper.

Dropping Rods—A Simple and Inexpensive Device.—Dr. F. Esch and Prof. J. Traube have devised the simple dropping implement shown in operation by Fig. 4. It consists of a glass rod, which may be of variable calibre to accommodate different sized bottles, bent at right angles in the shape of the letter L—the inner and shorter surfaces of each arm being grooved. Obviously this simple instrument, which serves the purpose admirably, can be produced so cheaply that it may be included in the medicine supplied to the patient without extra expense. By means of the groove of regulation size, accurate and uniform drops may be obtained.—Pharm. Ztg., Aug. 10, 1901, 637.

Stopped Burettes—Stopper-Holder when not in Use.—F. H. A. suggests a simple contrivance for the reception of the stoppers of burettes when not in actual use, which consists in making a circular slot in a clamp holding the burette, of sufficient size to receive the stopper conveniently. The idea is fully illustrated by the accompanying diagram.

FILTERING PIPETTE.

The filtering attachment, filled with cotton-wool ("absorbent cotton," *c*), is temporarily attached to the jet, *A*, of a 5 c.c., pipette by means of the rubber tube, *B*.

absorbent cotton (*C*), which by means of a short section of rubber tubing (*B*), is slipped over the regular pipette (*A*). A sufficient quantity of the clear fluid having been drawn through *C*, the rubber tubing *B* is slipped off and the contents of *A* are employed for the test to be made.—Chem. News, Sept. 27, 1901, 157.

Weighing Glass Containers—Precautions.—A. B. Lyons calls attention to the necessity of verifying the tare of glass beakers, flasks or other containers from time to time. Although the tare of such is usually assumed to be an absolutely constant quantity, leaving out of consideration the infinitesimally small losses resulting from ordinary usage; in reality the same utensil may lose or gain in weight according to conditions and circumstances. The author mentions numerous instances in which such variations have been observed. Thus a beaker may have been kept for some time in a desiccator before weighing, and yet on wiping its weight would become lowered; then, if placed in the desiccator again for fifteen or twenty minutes the weight would come back to normal. It is therefore safer always to

Extraction Apparatus—Simple and Economical Construction.—L. D. Havenhill describes the simple extraction apparatus intended to meet the requirements of students in plant analysis, shown by Fig. 8, for which he claims no originality. It is simply a rearrangement and combination of instruments that have long been in use by those engaged in this kind of work. The use is obvious, but the following description and specific direc-

FIG. 8.

It consists of a percolator-tube about 15 mm. less in diameter than the outer jacket. The latter is provided with an exit tube, near the middle of its height, which descends to the receiving vessel, from which the volatile solvent employed is distilled back into the jacket and condensed in the upright condenser fitted in the large upper orifice by the aid of a perforated cork. In the bottom of the percolator-tube is placed a small pellet of absorbent cotton and above this an accurately-fitting disc of filtering paper. The required weight (5 grams) of the drug of the proper degree of fineness (80–100) is now added, using care not to pack it in the least, or the percolation is liable to be slow or at least very much impeded. Next add another disc of filtering paper accurately fitted as before. This should be pressed down to within about 5 mm. of the drug; it should not be pressed on the powder for the same reason that the drug should not be packed. Another small pellet of cotton is now added to keep the disc of filtering paper in place and to break the force of the fall of the solvent from the condenser. It is best to use cotton and filtering paper that has been previously extracted with the solvents that are intended to be used. A sufficient quantity of the solvent having been introduced, the extraction is carried on in the usual way, and when it is complete, the percolator is lifted out, allowed to drain, then connected with an aspirator and placed in the drying oven and aspirated until all the solvent has been removed. It may then be weighed if desired, thus keeping a check on the amount of matter extracted.—Drug.

Extraction Apparatus.

Circ., Sept., 1901, 193.

In a paper on "plant analysis," Prof. L. E. Sayre takes occasion to call attention to the extraction apparatus devised by Mr. Havenhill, which, while combining cheapness and efficiency, even in the hands of the inex-

leaning against the shelving, and before he finds time to detach the various parts, it may fall over and be broken. A new design has recently been made which overcomes this difficulty, the change consisting in bending the

FIG. 9.

delivery tube, as shown by Fig. 9. Although this is only a slight change, it is a very important one. The apparatus, when entirely fitted up with condenser and receiver, will remain erect on the table without the least support, and when the condenser is detached, the percolator and receiver will stand considerable jogging without toppling over.—Drug. Circ., Jan., 1902, 4.

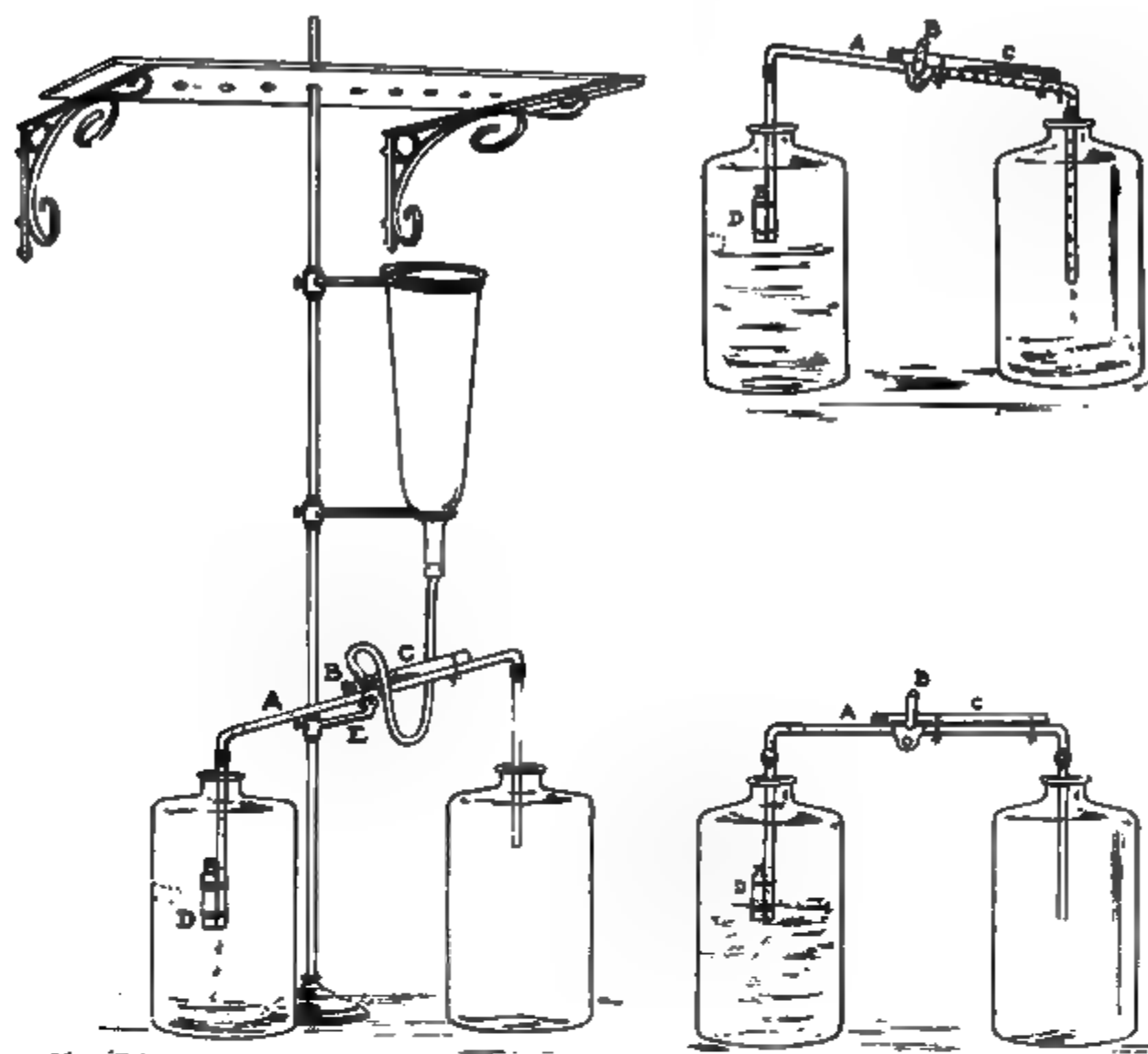
Percolation—Manipulation in Case of Resinous Drugs, etc.—F. W. E. Stedem calls attention to the necessity for more specific directions for percolating resinous and oleo-resinous drugs in preparing tinctures and fluid extracts. He finds that if the pharmacopœial directions are followed, for instance in making tincture of ginger, a considerable quantity of resinous material will separate itself from the fluid portion and is affixed firmly to the bottom of the vessel, and that this resinous material will resist all efforts at solution in the liquid portion. According to his observation, in this and similar cases, the author concludes that a certain oxidation of the resinous matter of the drug has taken place immediately after packing, and while the instructions of the Pharmacopœia as to maceration for twenty-four to forty-eight hours are being carried out. On this account he has adopted a process which has for some years uniformly given satisfaction, and which, it is believed, will obviate precipitation, and result in a more uniform preparation, as well as one representing the whole drug. The method con-

**Extraction
Apparatus.**

sists of simply moistening rapidly as directed in the Pharmacopœia, packing immediately, pouring on the menstruum and allowing it at once to drop from the percolator as rapidly as it may, and collecting it in a receiving bottle which has been made to contain a greater or lesser quantity of the percolating menstruum. It will be noticed that the denser particles coming through will at once dissolve in this menstruum, forming a clear solution, and that no precipitate will form. Allow the percolation to proceed until about one-fourth of the desired quantity of percolate has been collected, when the percolation should be stopped with a cork, or otherwise prevented from flowing, and the material allowed to macerate for from twenty-four to seventy-two hours. The process may then be resumed, and the percolate allowed to drop more or less freely according to the

Percolation—Automatic Cut-Off.—C. W. Sackett describes the automatic cut-off illustrated by Fig. 10, which commended itself for the purpose of cutting off the flow of percolate when a certain portion has accumulated in

FIG. 10.



Automatic Cut-Off.

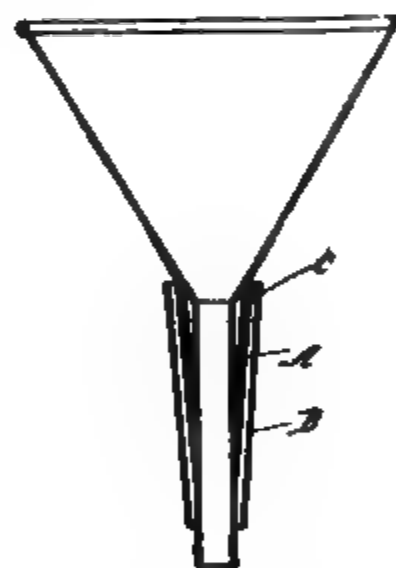
the receiving vessel. The tube *A* is arranged to move like a scale beam on the support *E*, and is connected with the percolator by a rubber tube at *B*. A long vial, *C*, is attached to this tube *A*, the vial containing from half to one ounce of mercury. An empty vial *D* is attached to one arm of the tube to act as a float. A quantity of water exactly equal to the amount of percolate which is to be reserved, is measured and poured into the bottle at the left of the apparatus and the float so adjusted that it will bring the tube *A* nearly in a horizontal position. Then throw out the water, replace the vessel and allow the percolation to begin. It is evident that as soon as the required quantity of percolate is reached the float will have carried the tube again to the original position, and as soon as it is exceeded the mercury will run to the right and tip end of the vial the other way, and the

Percolation—Use of Shredded Wood to Prevent Clogging.—J. Jarolim suggests shredded wood—such as is now used for packing (“Excelsior”?) REP)—to prevent clogging when percolating drugs of an adhesive nature, such as opium, etc. The shredded wood is first boiled in water containing $\frac{1}{2}$ per cent. sodium carbonate, then washed with water until the last washings have a neutral secretion, dried, and cut in lengths of 10 to 15 Cm. In use, a thin layer of cotton-wool is first placed in this percolator, then a thin layer of shredded wood followed by a similar layer of coarsely powdered drug, alternate layers of the shredded wool, and drug being added until all the drug has been introduced. Percolation is then effected in the usual manner, and proceeds expeditiously to the end with the expenditure of a minimal quantity of menstrum.—Pharm. Ztg., July 17, 1901, 574; from Pharm. Post, 1901, No. 26.

Funnels—A Useful Device.—David S. Horton has patented a funnel (shown by Fig. 11) that allows free egress for the air when pouring liquids by its aid into a bottle. The stem of the funnel, *A*, which is cylindrical, is surrounded by a loose conical sleeve, *B*, kept in place by wires, *C*, soldered to it and to the body of the funnel. There are, in addition, one or more vertical grooves, *b*, in the sleeve, which facilitate the escape of air from the bottle.—Merck’s Rep., September, 1901, 280.

Filtering Funnel—Construction for Self-regulating Supply.—N. Jenner has devised the simple apparatus shown by Fig. 12, which is simply an

FIG. 11.



Funnel Allowing Free Egress of Air.

FIG. 12.



Filtering Funnel.

adaptation of a method of filtration long in use. The novelty consists in the shape of the funnel, which up to a certain distance has the usual angle of 60° , thence continues straight upwards for a short distance for the reception of a rubber stopper, perforated in the center, for the reception

Filtrate Receiver—A Practical Device.—The apparatus shown by Fig. 13 exhibits a receiver for the collection of filtrates (and "percolates"—Rep.) which will readily appeal to the practical sense of the pharmacist. It is

FIG. 13.

Filtrate Receiver.

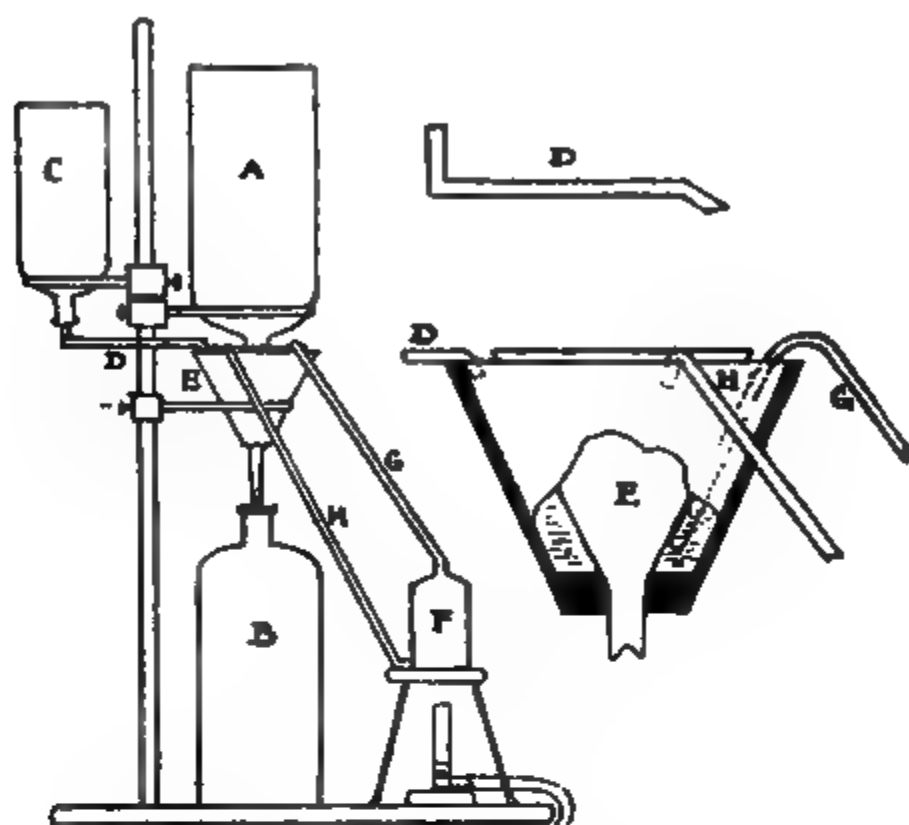
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essentially a straight-walled percolator, provided with a stop-cock beneath and, near the top, with a short tube by means of which it may be connected with a suction-filter pump. The funnel is inserted in a rubber stopper which closes the upper orifice of the receiver. By the aid of this receiver the more concentrated filtrates (or percolates—Rep.) may be withdrawn, a desideratum when filtering the more concentrated solutions from precipitates the washings from which have to be concentrated by themselves with the view of adding to the concentrated portion, or for other reasons.—Pharm. Centralh., Dec. 19, 1901, 817.

Hot Filtration—Home-Made Apparatus.—H. J. Hobden has devised and describes a home-made apparatus for hot filtration, the details of which are explained by the accompanying drawing (Fig. 14), which he has constructed from odds and ends about the shop. The apparatus consists of a jacketed funnel (*E*), which was constructed by fastening an ordinary ribbed glass funnel into a bung—to form the inner funnel—and

this bung he employed a paste of litharge and glycerin, which takes about 24 hours to set. The necessary water-space being thus supplied, the funnel is connected with the circulating boiler (*F*)—a copper lemon-oil container—by the tube (*G*), for the admission of steam, and the siphon-tube (*H*), for the return of the condensed steam. To supply the loss of water, due to evaporation, the supply bottle (*C*) is provided, the outlet

FIG. 14.



Home-Made Apparatus for Hot Filtration.

being through *D*, which dips just below the surface of the water in the jacket of the hot-water funnel. The bottle (*A*) contains the liquid to be filtered, the lip of this bottle extending slightly into the liquid on the filter, which is collected in the bottle (*B*). The source of heat is a Bunsen burner, the flame of which must be carefully regulated as soon as the water in the funnel has been heated to its maximum. The process then goes on automatically.—*Chem. & Drug.*, April 19, 1902, 601.

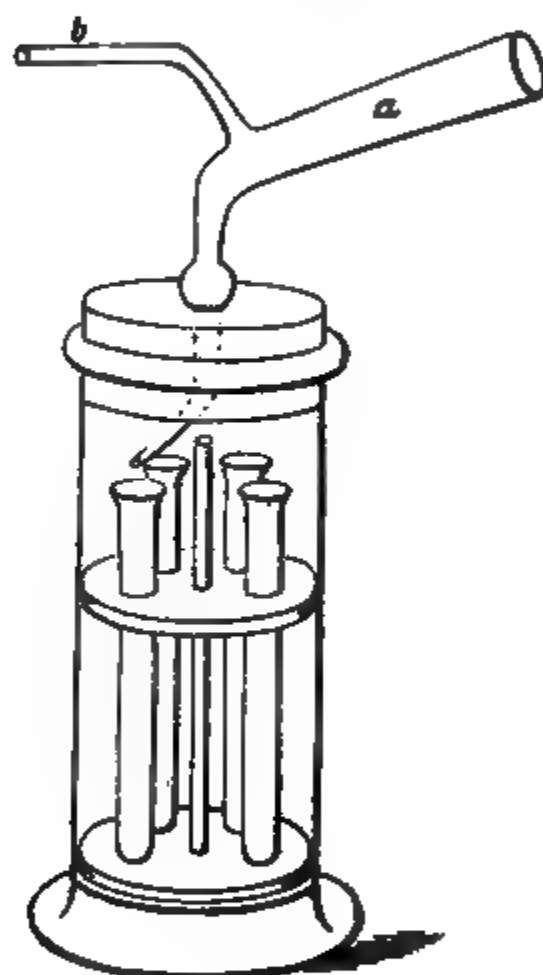
Distillation and Boiling Points—Influence of the Position of the Thermometer in Determinations.—As the result of a difference of opinion as to the distilling points of a sample of petroleum ether, T. Tyrer and C. T. Tyrer have made a comprehensive series of experiments which lead them to the following conclusions: In taking fractionations with a flask and not using a column, a bath should be used where possible, the temperature of which should be about 10°C ., and not more than 15°C . above the highest distillation point of the liquid under examination. Where a bath is not used, the upper part of the flask should be protected

should be used in which the thermometer is entirely immersed in the vapors. The bulb of the thermometer should be just in the neck of the exit tube, and not opposite it, as this latter is the point at which the vapor comes over. The asbestos disc employed by the authors was 12 inches in diameter, with a hole in the center, so adjusted that only the base of the tube or flask was exposed to the direct heat of the flame. The authors are inclined to favor the use of a tube (instead of a flask) long enough to include the whole of the thermometer. The differences in the readings due to variations in the condensers used, are so small as to be negligible. The paper is accompanied by numerous illustrations, which can be consulted profitably only in connection with the original text.—*Trans. Brit. Pharm. Conf.*, 1901, 401-404.

Vacuum Receiver—Convenient Construction for Fractionations.—Dr. Walther Burstyn has devised a useful vacuum receiver for small fractioning

FIG. 15.

FIG. 16.



Delivery Tube.

Receiver for Fractional Distillation.

operations in which it is important to prevent loss due to adherence of portions of the fractions on the walls of the cooler. The delivery tube, as shown by Fig. 15, passes through a rubber stopper into the interior of the receiver, and delivers the condensed liquid successively and directly into

nected by means of rubber tubing with the suction pump in the usual manner.—Pharm. Ztg., Feb. 12, 1902, 122; from Oest. Chem. Ztg., 1901, No. 24.

Receiver for Vacuum Distillation—A Simple Arrangement for Fractionation.—Wilh. Steinkopf has devised the receiver for fractional distillations under reduced pressure shown by the accompanying cut (Fig. 16), which requires little explanation. The adapter, *a*, which is provided with a small bend-tube, *b*, by which it is connected with the vacuum-pump, reaches into the receiver through the central-bore of a close-fitting rubber stopper, the delivery end of the adapter being bent as shown. The stopper closes a cylindrical glass vessel of suitable dimensions to hold four or more test-tubes, which are so placed in the interior that by a partial turn of the cylinder, they may be brought consecutively under the delivery tube of the adapter, the latter being, of course, connected securely with a suitable condenser.—Pharm. Ztg., June 14, 1902, 466.

Single and Triple Bunsen Burner—A Commercial Device.—F. Stolle has invented the combination Bunsen burner shown by Figs. 17 and 18, which possesses the practical advantage that by a turn of the gas-cock the

FIG. 17.

FIG. 18.

FIG. 19.

Bunsen Burners.

inflow to the single burner, as shown in Fig. 17, is cut off and transferred to three adjacent burners, as shown in Fig. 18, without interruption, the gas in the triple burner igniting at the moment that from the single burner is extinguished. In the same way, by a return to the original position of the cock admitting gas to the single burner, this is ignited and the flame from the triple burner is extinguished.—Pharm. Ztg., Aug. 7, 1901, 630; from Chem. Centralbl., 1901, 11, No. 1.

Fig. 19, by means of which the inflow of gas can be regulated so that the formation of a smoky flame is absolutely avoided. The inflow of gas is adjusted by means of a screw cap, having a conical bore and capable of being raised or depressed around a fixed piston or pin by a simple turn of the screw. The burner itself can also be raised or lowered, being held in place by a set-screw. To prevent the return of the flame when turning it down, the burner is provided with a cap of wire netting.—Pharm. Ztg., Febr. 12, 1902, 122; from Chem. Ztg., 1902, No. 1.

Drying Closet—Improved Construction for Analytical Operations.—H. Thoms has devised a new form of drying closet, the essential features of which are illustrated by the accompanying cuts. Fig. 20 shows the closet

FIG. 20.

Fig. 20. Drying Closet.

Drying Closet.

with the drop-door open. This door is lowered or closed with the utmost facility, without in the least disturbing the contents of the filter, and when open rests rigidly in a horizontal position. It is furthermore provided with

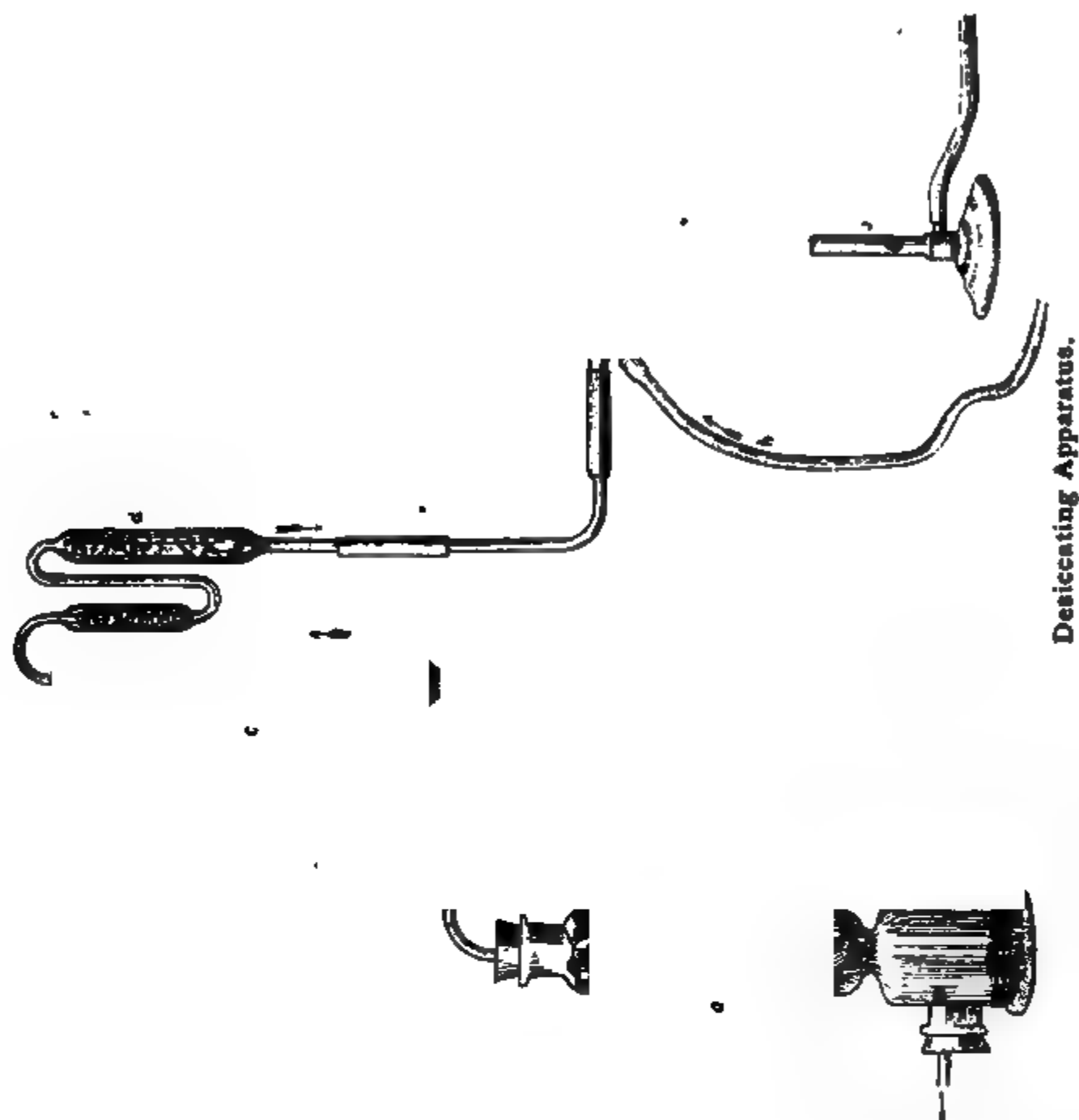
ing the funnel contents, the funnels themselves resting in sockets provided at the four corners of the slide. The central plate of the slide serves for the reception of watch glasses, small capsules, beaker, etc. The source of

FIG. 21.

heat is an ordinary laboratory burner, and is controlled by a flame regulator, the double bottom with ventilator, and the thermometer, after the usual manner. The metal used in its construction is aluminum, and it is supplied (in Berlin) in two forms, one to be suspended on the wall, the other to rest upon the work table.—Pharm. Ztg., Mar. 12, 1902, 201.

Desiccating Apparatus—A Convenient Form for Drying Analytical Residues.—Prof. L. E. Sayre has constructed and describes the apparatus shown by Fig. 22, which he finds convenient and efficient for drying residues resulting from assay processes to constant weight without undue exposure to heat, and for other similar purposes. The apparatus is easily connected with one of the forms of filter pumps in common use, and the diminution of pressure controlled by the opening or closing of a stop-cock for the admission of air. The heat of the evaporating chamber is regulated by a coil of pipe surrounding the pan, through which pipe a stream of water, raised to any desired temperature, is constantly passing. The apparatus consists of two accurately-fitting hemispheres which are 4 inches in diameter, inside measurement. It is an ordinary vacuum pan in miniature. The upper hemisphere is provided with a stop-cock and a gland for the admission of a thermometer. The stop-cock is connected also with a pressure gauge, which in turn is connected with a vacuum pump. The lower hemisphere is fitted with a diaphragm *i*, to support the material and to distribute the air which enters through a stop-cock at the bottom of the vessel. Figure *e* represents a small brass boiler or water-bath provided with a thermometer, to be heated by means of the burner *j*. The cool water enters the boiler through the tube *h*; the warmed water is conducted through a brass spiral surrounding the lower hemisphere. The current of air which passes through the boiler and enters the vacuum pan is thoroughly dehydrated by passing through sulphuric acid towers *a* and *b*, and

FIG. 22.



before entering the vacuum chamber *f*, as before stated.—*Drug. Circ.*, July 1901, 137.

Mantle for Spirit Lamps—A Useful Contrivance.—E. Kirchner has employed the mantle shown by Fig. 23 with advantage for heating operations with spirit lamps. The spirit lamp should have a capacity of at least 100 Gm., and with such, protected by the mantle, operations of boiling can be effected with celerity. The construction of the mantle is clearly evident from the drawing and requires no special description. A section

Mantle for Spirit Lamps.

Heat Collectors—A Practical Device.—Carl Jung has devised the covers for crucibles and evaporating capsules illustrated by Figs. 24 and 25,

FIG. 24.

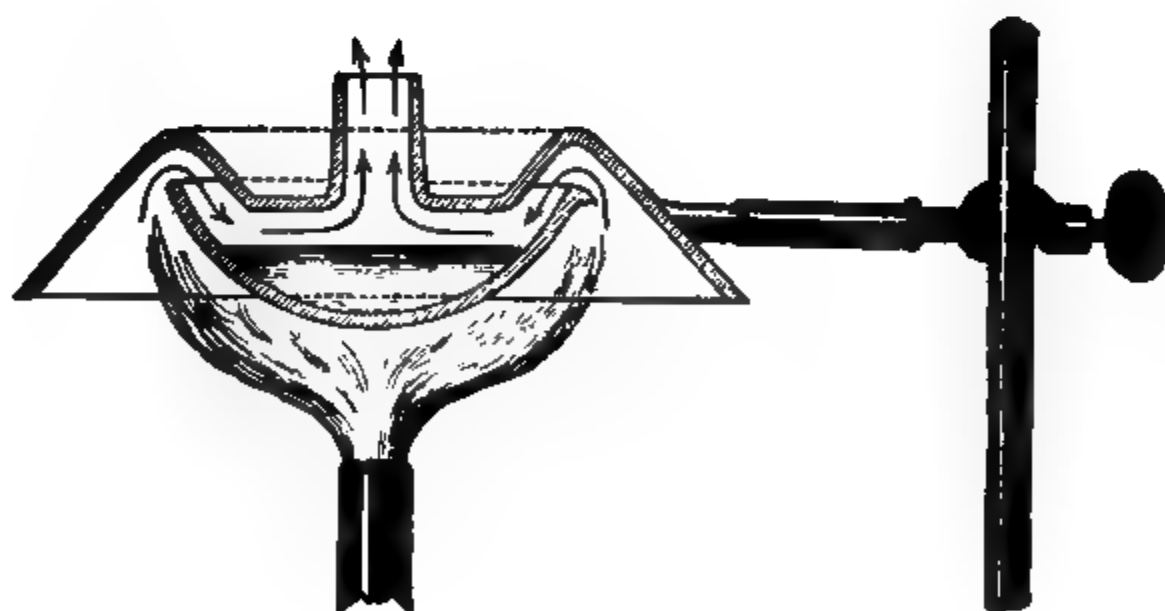


FIG. 25.

Heat Collectors.

capsules. The arrows point out the direction of the heat current, which is thus brought in close proximity with the contents of the vessels. In crucible operations the opening in the heat collector permits the introduction of nitric acid, ammonium carbonate, etc., without its removal, while the current of heat carries with it atmospheric oxygen, access of which is of advantage and materially shortens many operations. Similarly, in evaporations, the heat current produced rapidly carries off the vapors which otherwise rise slowly from the surface of the evaporating liquid.—Pharm. Ztg., Feb. 12, 1902, 123.

Glass Immersion Grate—A Convenient Device.—A. Hinterberger employs the little glass implement illustrated by Fig. 26 for immersing and removing cover-glasses from boiling corrosive and acid fluids conveniently.

FIG. 26.

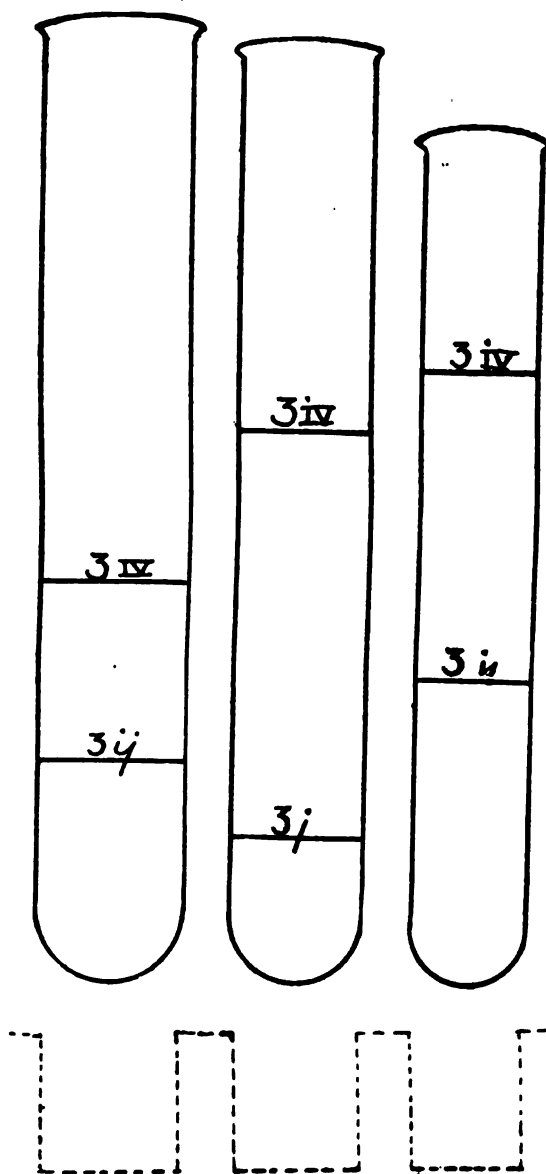
Glass Immersion Grate.

As shown, it consists of a circular grating constructed of glass rods, provided with a long handle attached at a right angle to its periphery. Its immersion also serves the purpose of preventing the bumping of the boiling fluid.—Pharm. Ztg., Nov. 9, 1901, 896; from Centralbl. f. Bakt., xxx, No. 11.

Test Tubes—Approximate Determination of Capacities.—Some time ago F. H. Alcock pointed out the need for graduated test tubes, so that a quantity of solution might be conveniently measured directly in them (see Proceedings, 1901, 530). A correspondent of the "Chemist and Druggist" now suggests an expedient to gain this end, which becomes clear by consulting the accompanying drawing (Fig. 27). It consists of a "laboratory card" on which six different sizes of test tubes are depicted—only three of them being shown in the drawing. The dotted portion at the bottom is for use as a gauge of the internal diameter of a tube, and when

the size is known the graduations will indicate approximately the capacity by holding the tube in front of the card.—Chem. & Drugg., Aug. 10, 1901, 286.

FIG. 27.



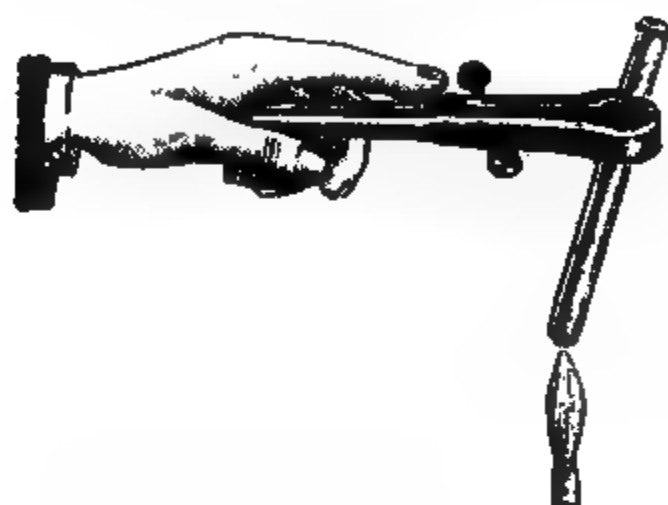
Test Tubes.

Test Tube Heater—Convenient Construction.—C. Liebermann has de-

of test-tubes for simultaneous heating without individual attention. It consists of a truncated cone of tinned iron, the inner surface of the bottom separated by a wire net so as to avoid direct contact with the test-tubes. The latter are held in place by an undulating band of tinned iron riveted to the inner and upper margin of the cone—each undulation affording the

FIG. 28.

FIG. 29.



Test Tube Clamp.

Test Tube Heater.

space necessary for one tube. The practical application of this little contrivance is well shown in the drawing.—Pharm. Ztg., Sept. 14, 1901, 739 ; from Chem Ztg., 1901, No. 65.

Test Tube Clamp—Improved Construction.—Frank has devised the improved test-tube holder or clamp shown by Fig. 29, the improvement consisting in a spring attachment to the side of the handle which keeps the test-tube securely in position until it is released by the pressure of the finger.—Pharm. Ztg., July 17, 1901, 573 ; from Chem. Ztg., 1901, No. 53.

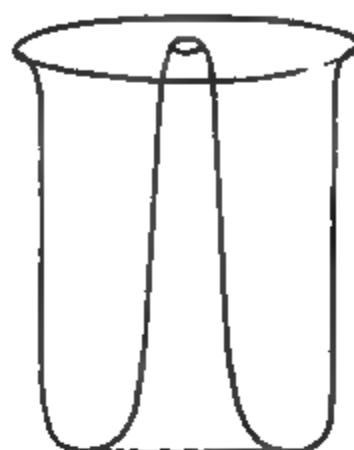
Test-Tube Rack—Convenient Construction for Parallel Experiments.—Dr. Walter Schacht has devised an arrangement of test-tubes in the circular rack shown by Fig. 30, which insures a convenient and absolute separation of the test-tubes employed in parallel experiments. For this purpose the circular disc is constructed with quadrants of different colored wood, each quadrant being provided with the same number of holes, varying in

offers a convenient receptacle for different sized test-tubes employed for general purposes.—Pharm. Ztg., Sept. 14, 1901, 739; from Chem. Ztg., 1901, No. 32.

Beakers—New Construction to Secure Quick Ebullition.—Robert Müller constructs a new form of beaker which is drawn upwards in the shape of an elongated cone or spindle as shown by Fig. 31. This construction has the two-fold advantage that it overcomes the tension inherent

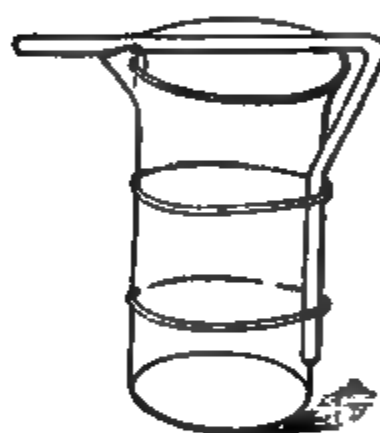
FIG. 30.

FIG. 31.



Beakers.

FIG. 32.



Test-Tube Rack.

Decanting Rod.

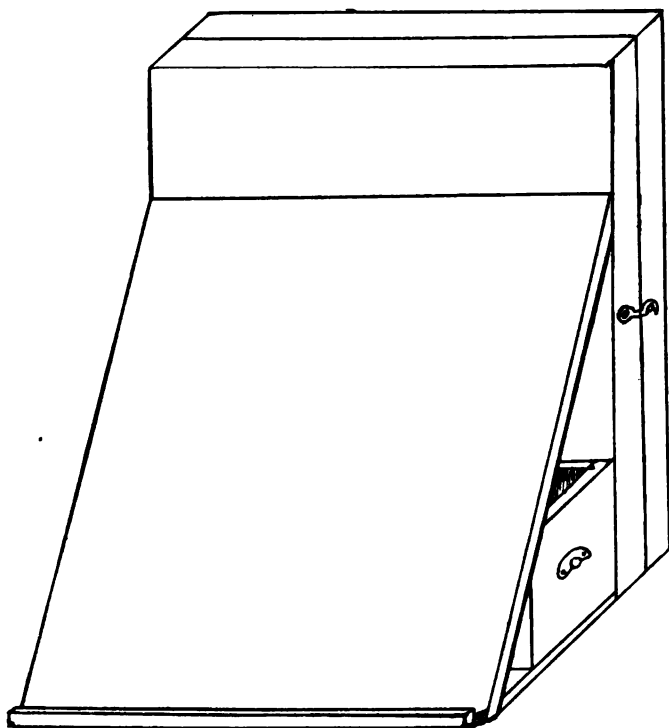
to flat-bottomed beakers, which is the not infrequent cause of fracture, and that the liquid introduced into it is heated to boiling with greater celerity.—Pharm. Ztg., Sept. 14, 1901, 739.

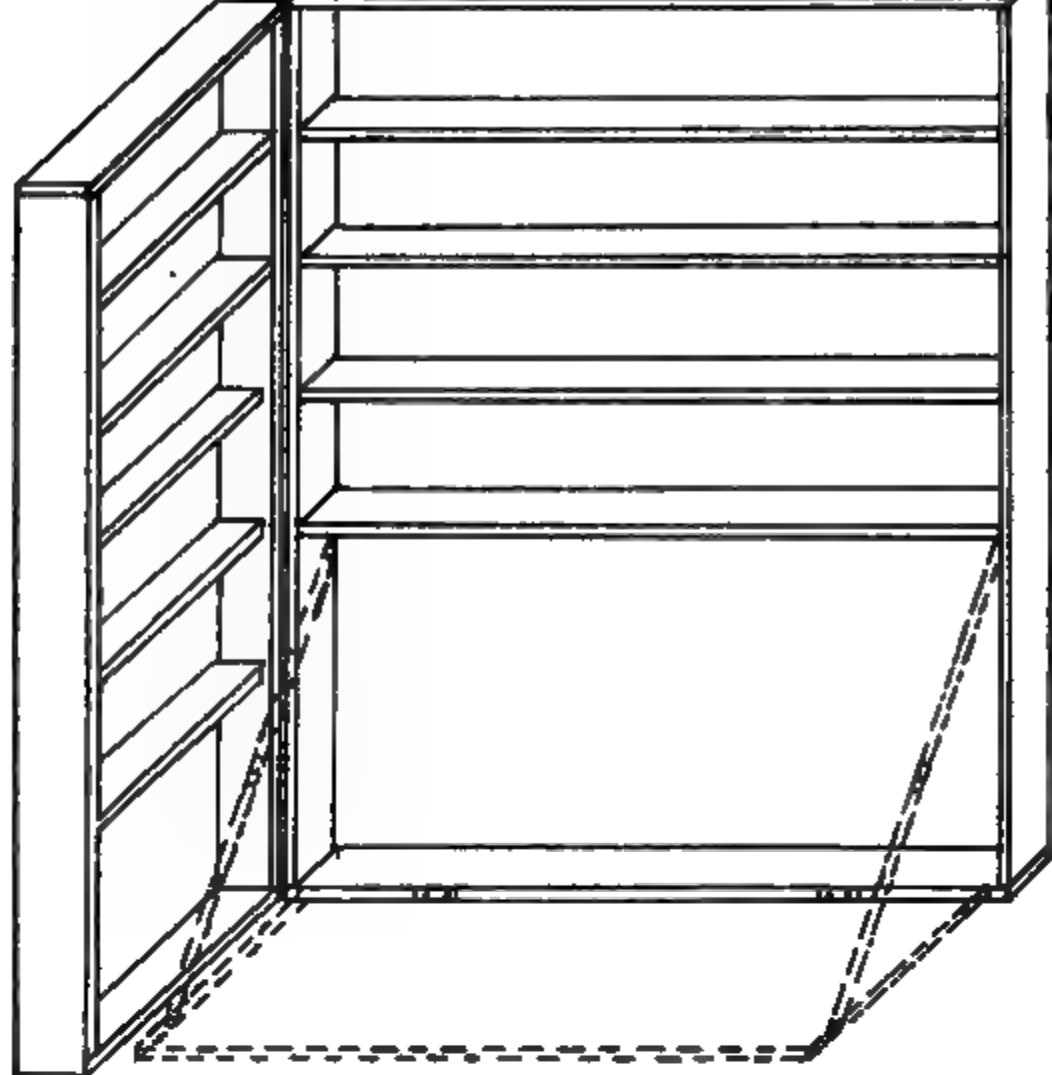
Decanting Rod—Convenient Construction and Application.—A. Stock recommends the application of a glass rod, bent as shown in the drawing (Fig. 32), as a practical aid in decanting liquids from beakers, the rod being held in place by means of rubber bands. Attached in this way, one of the operator's hands is free to manipulate the spritz-bottle when transferring precipitates from the beaker to a filter, while in any event the

pouring out of liquids from the beaker can be accomplished with absolute convenience and security against loss.—Pharm. Ztg., July 17, 1901, 571; from Chem. Ztg., 1901, No. 51.

Reagent Closet—Handy Construction.—W. A. Dawson describes the reagent and apparatus closet shown by Fig. 33. It is composed of two sections, the one hinged serving as a door, the other fastened or resting against the wall. The broken lines in the sketch indicate a board of the same thickness as that used for the outside of the closet. This is hinged to the lower edge of the closet, and when the door is opened, drops down and forms a working board, being held at a level by two long steel cover holders similar to those used on trunks to hold the top of the trunk up. This board is square in shape, of the dimensions of the inside width of the closet, a sufficient number of the lower shelves on the door being made an inch narrower to allow the door to close tightly when the board is folded up. The inside of the closet should be painted a dead black to prevent actinic action on its contents. A commercial size of this closet, which can be readily constructed according to this description with the aid of the cut, may contain all the U. S. P. reagent solutions, together with other necessary containers, and should contain the following apparatus: A rack of test tubes, 3 to 10 inch; a Florence flask of 50 Cc., one of 100 Cc. and

FIG. 33.





Reagent Closet.

one of 200 Cc.; a nest of beaker glasses; a small precipitation jar; two 100 Cc. conical glasses, for urine testing; a 10 Cc. and a 100 Cc. graduate; watch glasses of assorted sizes; microscope slides and cover glasses and turn-table; an alcohol lamp; a chemical and a floating thermometer, urinometer, specific gravity beads, etc.; the tubes and test glasses used in urine testing, and the brushes to clean them with being kept separate from the others.—Drug. Circ., Jan., 1902, 5.

Siphon for Poisons and Acids—A Simple Contrivance.—Gawalowski describes the simple arrangement shown by Fig. 34, for draining acids or other poisonous or unpleasant liquids from large containers. The container is fitted with a tube *a*, bent as shown, and a second tube *b*. In use, the tube *a*, is filled by blowing into *b*. When filled, it is only necessary to tilt the container slightly to start the flow.—Pharm. Rev., Dec., 1901, 543; from Pharm. Post, 34, 233.

Gas-Washing Apparatus—Compact and Convenient Form.—F. M. Alcock finds the combination generator and wash bottle, shown by Fig. 35, to be very useful for small operations in which such gases as H_2S , etc., are required. The washing compartment consists of a glass two-bulb siphon

bent round, so that by rubber tubing the delivery tube may be conveniently attached when required for use. The siphon part is charged by suction with a suitable quantity of water—for washing—or sulphuric acid—for

FIG. 34.

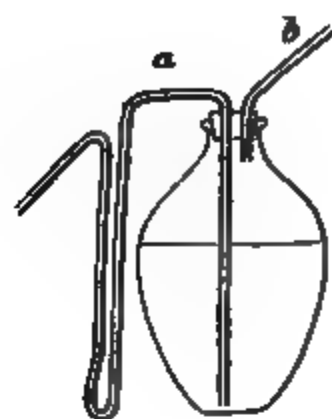
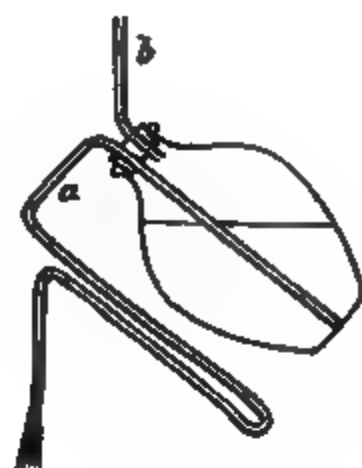


FIG. 35.



Siphon for Poisons and Acids.

FIG. 36.

B

D

Water Motor.

Gas-Washing Apparatus.

absorption, or other solutions required for the purification of the gas generated.—Pharm. Journ., Feb. 8, 1902, 105.

Water Motor—A Home-Made Contrivance.—A. T. Van Cleve has constructed a water motor, suitable for moderate power, such as running a drug mill or tablet machine, which is shown by Fig. 36, and is described as follows: On a small wooden cart wheel, curved strips of tin are fastened as shown in this sketch. To the axle of the wheel is fastened a belt, connected with another wheel attached to the machine which it is desired to operate. A hose nozzle is attached to the water faucet connecting with the city main, and the drive wheel of the motor is arranged under the nozzle in such a manner as to receive the full force of the water.—Amer. Drug., Jan. 13, 1902, 3.

Prescription File—A New Idea.—Joseph F. Hosteley calls attention to a compact arrangement for compactly storing prescription files, of the long-wise type, compactly and rendering them conveniently accessible. The arrangement is shown by Fig. 37, and is described as follows: Half-

wider than the width of a prescription file. A hook in the wall allows one file to hang just above the floor, and a cord running through two blocks made fast to the ceiling supports another file above the first, allowing it to be raised and lowered at will. The wire of this file is bent into an eye

FIG. 37.

Prescription File.

with which a hook fastened to the end of the tackle engages when the file is to be elevated. Just beneath the upper file a piece of tin or other metal is made to span the compartments, bent in a double curve from the back to fall gradually toward the front, as seen in the sketch. This expedient guides the upper file properly in its ascent and descent, preventing it from coming in conflict with the lower file.—Bull. Pharm., April, 1902, 152.

Prescription Filing—Simple Suggestion.—Anthony Extel suggests the following simple mode of filing prescriptions: On the desk use an ordinary spindle file. Number each prescription carefully on the lower right-hand corner, and place on the file about three-quarters of an inch from the top, so that the perforation will not damage the prescription in the least. When one or two hundred prescriptions have accumulated, they are removed from the files in bunches of one hundred, and placed on the desk face upward—that is, the largest numbers appear on the top as on the file. They are then made into books of 100 each, using a heavy manila paper to form a cover. Through this cover force an ordinary brass fastener (McGill's), place the prescriptions on this, one at a time, beginning with the largest number, so that when complete they appear as a book with the smallest numbers on the top; bring top cover over and bind with fastener; this completes one book. Ten such books constitute one box. Each book is numbered on the top, so that when stood upright in the box the contents of each book can be seen at a glance.—Merck's Rep., Nov., 1901, 359.

B. PREPARATIONS.

AQUÆ.

Distilled Water—Preparation and Preservation.—Charles Umney, after a practical experience of nearly forty years in producing distilled water on a manufacturing scale, feels warranted in saying that it is only a question of a strict adherence on the part of the producer to well-known engineering principles and a co-operation on the part of the receiver (the pharmacist) in taking certain wholesome precautions, that the supply may be invariably found when wanted in a uniformly good condition. The following leading facts are worth consideration:

1. The water must not be condensed waste steam of the laboratory, but must be a *bona fide* distilled water.

2. Distilled water of almost absolute chemical purity may be obtained by the use of the machine known as a ship's condenser. By its agency, water as pure as that which is drunk (both aerated and carbonated) on the Atlantic and other steamers can be ensured.

3. It is not practicable that distilled water, used as it is at times in considerable quantity, can be sent from the wholesale druggist to the pharmacist in Winchester quarts. A very excellent arrangement, however, is to adopt a white earthenware bottle (of 2 or 3 gallons capacity) with a label burnt in blackest possible type on its shoulder, thus: "Distilled water. Bottle not to be used for other purposes."—Pharm. Journ., Mar. 29, 1901, 261.

Aromatic Waters—Preparation by Distillers from the Oils.—Frank Edel, after much experimenting with aromatic water, finds no process more

satisfactory than that of distilling water with an essence of the desired oil. The distillate is preserved in suitable containers, in which the oil will rise to the top, the water being withdrawn from beneath, as required. In this way the aromatic water may be kept fresh and sweet for six or eight months at a time. He has never tried to make water from either rose or orange-flower oils, however, considering them poor substitutes for the water distilled from the flowers. If, on keeping, the latter appear to be losing their characteristic odor, it is only necessary to remove the cork from the container for twenty-four to forty-eight hours, when they will be found to have recovered their aroma.—*Amer. Drugg.*, Nov. 25, 1901, 311.

Anise Water—Preparation.—Contending that most essential oils can be dissolved to full saturation in distilled water without the intervention of such substances as calcium phosphate and the consequent introduction of objectionable impurities, A. C. Abraham points out that anise water is an exception. This cannot be made with or without distillation, owing to the insolubility of anise oil in water, unless some spirit is used, or something employed to suspend the oil. *Pharm. Journ.*, Mar. 29, 1902, 255.

Bitter Almond Water—Estimation of Hydrocyanic Acid.—The French pharmacopœial commission has adopted Liebig's method, improved by Deniges, for the estimation of HCN in bitter almond water, which, according to Bourguelot, is as follows: 100 Cc. are treated in a 250 Cc. flask with 10 drops of solution of sodium hydroxide, 10 Cc. of ammonia (ammonia water?—Rep.) and 10 drops of 20 per cent. solution of potassium iodide, and the mixture is then carefully titrated, drop by drop, to permanent opalescence.—*Pharm. Ztg.*, Dec. 28, 1901, 1033; from *Jour. de Pharm.*, 1901, No. 11.

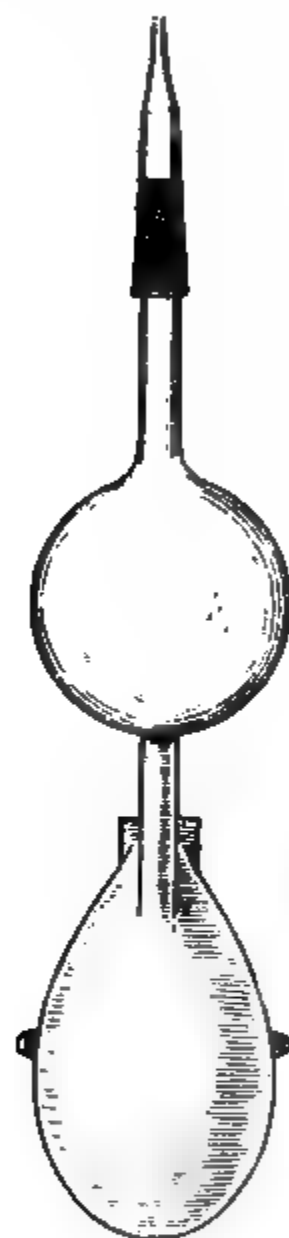
Orange-Flower Water—Restoration of Mouldy Samples.—According to Manseau, by shaking orange-flower water which has become yellow, cloudy and full of growths with sand it can be recovered and made suitable for purposes other than medicinal. The sand is prepared by boiling with double its volume of water acidulated with hydrochloric acid, decanting, washing with water to get rid of the acid, and calcining. About 2 oz. of prepared sand is shaken with one pint of orange-flower water, at intervals, for ten or fifteen minutes, and filtered.—*Chem. and Drug.*, Feb. 1, 1902, 216; from *Bull. Soc. de Pharm. de Bordeaux*.

CAPSULÆ.

Gelatin Capsules—Methods of Encapsulating Liquids.—In response to a "prize query" on the best method of encapsulating liquid drugs, several writers have contributed papers which are published in the "*American Druggist*" (March 10, 1902, 129-132). Louis Emanuel finds it quite practicable to use both hard and soft capsules for this purpose, but gives preference to the latter. If hard capsules are employed, it suffices to place them in perforations made in a paste-board box lid, of a size to

it over the filled body and allow it to stand a short time to dry. In this way fixed and volatile oils, or alcoholic liquids containing not less than 50 p. c. of alcohol, may be securely encapsuled. Soft capsules should securely rest in holes of proper size to accommodate them, bored into a strip of wood of suitable size. After all have been filled, the capsules are superficially sealed by passing a hot iron over their orifice, three capsules at a time, and then perfectly sealed by applying a little melted sealing gelatin to the constricted or partially closed orifice, by means of a pointed

FIG. 38.



A Bulb Pipette.

stick of the size and form of a penholder. The sealing gelatin is composed of gelatin, 3 parts ; glycerin, 2 parts ; water, 5 parts. If the capsules are to be filled in quantities, the following method is best on account of rapidity and permanency of the form of the finished capsule : A bulb pipette of a size that the bulb will hold a fluid ounce is provided with a

rubber bulb (an old-fashioned syringe bulb) at the upper opening ; the lower end should have a point as fine as an ordinary medicine dropper, or a dropper pipette may be attached by slipping a small piece of nursing bottle tubing on the end of the bulb pipette, as shown in the accompanying illustration, Fig. 38). This forms an air-tight union upon slipping the dropper pipette over the rubber, and the whole forms an apparatus similar to that pictured in the figure shown herewith. Compressing the rubber bulb, the end of the pipette is dipped into the liquid to be encapsulated and the pressure is released ; the liquid being then drawn into the glass bulb, is ready to be transferred to the capsule ; the pipette is taken in the right hand, with its opening pointing downward toward the left hand, in which the capsule is held, after which a slight pressure of the thumb and forefinger of the right hand on the rubber bulb will fill the capsule instantly, which is then placed in the perforated stick. After several hundred are thus filled, they are removed to a cool cellar and in a place where there is considerable moisture for about twenty-four hours. This will cause the liquid to contract and the capsule to expand. The capsules are sealed, as previously described, forming a capsule which always retains its form, and will not collapse, since as the liquid again expands at a normal temperature, it causes a constant tension on the capsule.

An Ingenious Mold Device for Hard Capsules is described by Richard Kaebler as follows : Take a flat wooden or tin box of a size large enough to accommodate a sufficient number of the capsules to be filled ; fill the box with a paste of plaster of Paris, and when the paste is beginning to set and is of a sufficiently thick consistency, sink the empty capsules in the mass to about two-thirds of their depth, inserting them at equal distances apart. When the plaster has set hard, remove the capsules. In this way is formed a cheap and efficient mold for the reception of empty capsules. The sealing of the capsules after they are filled is readily accomplished by touching the lower edges of the caps to a thin layer of water on a slab or tile, and allowing them to dry for a minute or two.

The remaining papers are in a similar vein to the preceding, preference being in each case manifested for soft gelatin capsules. Speaking of thick oleoresinous liquids and the like, which cannot be readily introduced by a dropper, Isaac M. Weils suggests the use of a clean wire. This is dipped into the liquid and the adhering drop carefully transferred to the capsule, held between the thumb and fingers, until filled.

Gelatin Capsules—Want of Uniformity in Methods of Filling.—A. B. Burrows, who has had considerable experience in filling prescriptions in the larger eastern or northern cities, as well as in the south, observes that in the north it appears to be the prevailing custom to mass the ingredients before introducing them into gelatin capsules, while in the south preference is given to their introduction in the form of powder, whenever the nature of the ingredients prescribed will permit this. He prefers the latter

ing and adjusting each capsule on the prescription balance. By slightly dampening the powder, it is quite possible to compress comparatively large quantities into small capsules.—Bull. Pharm., Jan., 1902, 15.

Gelatin Capsules—Convenient Method of Dispensing Oils.—John H. Haydon, Jr., recommends the following method for dispensing oils, balsams, creosote, etc., or their mixtures in gelatin capsules: Use sufficient powdered licorice to absorb the oily mixture and make it fairly dry; ascertain the total weight, determine what each capsule must weigh, and fill the capsules in the usual way as though it were with a dry powder.—Amer. Drugg., Sept. 23, 1901, 169.

Hard Capsules—Convenient Method of Filling with Essential Oils.—According to William G. Toplis a very speedy and convenient method of filling essential oils into hard capsules, in a cleanly and compact form, is the following, illustrated by 30 minims of terebene, for instance, to be filled into 12 capsules: One-half drachm of *potato* starch is placed upon a tile, the terebene poured upon it, and an intimate mixture is effected by means of a spatula. To the thin-flowing mixture produced now add three or four drops of water and stir briskly, when, at once, the mass begins to stiffen. Again add a few drops of water, with stirring as before; repeat if necessary until the mass becomes quite solid. It may now be formed, by aid of a couple of spatulas, into a rectangular figure, and subdivided into the requisite number of parts, which are readily introduced into No. 3 capsules. Arrow-root may be substituted for potato starch, but then No. 2 capsules will be required.—Amer. Journ. Pharm., Jan., 1902, 36.

Enteric Gelatin Capsules—Preparation with Acrolein.—According to Hausmann, gelatin capsules, filled as may be required, are readily rendered enteric by placing them into a 0.5 to 1 per cent. solution of acrolein—the strength of the latter depending on the thickness of the walls of the capsule. After an immersion of 10 to 20 minutes, they are removed and dried at 30° to 50° C. So treated the capsules are almost completely insoluble in warm water and in the stomach, but in contact with the pancreatic fluid they are digested in the course of two hours.—Pharm. Centralh., Dec. 26, 1901, 831; from Chem. Ztg., 1901, 960.

"Ovula" Glycerini—A New Form of Glycero-Gelatin Preparations.—J. J. Hofmann calls attention to "ovules" and "glycovules," popularly employed in France in the treatment of female diseases. They are essentially globular masses of glycero-gelatin, weighing about 16 Gm., with which various medicinal agents have been incorporated. Mr. Hofmann has found the following proportions most suitable for preparing similar ovules: White gelatin, 50 Gm.; water, 100 Gm.; glycerin, 250 Gm. Evaporate on a water bath to 300 Gm. add the medicinal ingredient, and



CARBASSUS.

Carbolized Gauze—Determination of Phenol in Presence of Resinous Substances.—Having occasion to determine the amount of phenol in a number of samples of carbolized gauze, in which the phenol was "fixed" by the aid of resin, J. C. Thresch, after numerous experiments, devised the following method, which gave very concordant and accurate results:

About 20 Gm. of the gauze was placed in a flask of about 700 Cc. capacity, 500 Cc. of water acidulated with hydrochloric acid added, and a few fragments of granulated zinc. Heat is applied, and about 300 Cc. distilled over slowly. This distillate practically contains the whole of the phenol, which can be readily determined by the bromine process. The zinc enables the boiling to be carried on steadily, and the gas bubbles, with a little manipulation, keep the gauze from matting together.—Trans. Brit. Pharm. Conf., 1901, 395-396.

Iodoform Gauze—Determination of Quality and Estimation of Iodoform.—Arzberger criticises the different methods that have been proposed for the estimation of iodoform in gauzes, cotton, etc., grouping them as follows:

1. *Extraction of Iodoform* with ether or alcohol, and conversion of the product by means of silver nitrate into silver iodide, and weighing as such. This constitutes the original method, but has been modified by Gresshoff and by Kremel.

2. *Decomposition of Iodoform* with alcoholic potash or soda, and titration of the product with $\frac{N}{10}$ or $\frac{N}{20}$ silver nitrate. Methods: Bolding, Gay, Droop-Richmond, Astrue, Schacherl.

3. *Elimination of Free Iodine from Iodoform* and titration of the iodine with sodium thiosulphate. Methods: Jaworowski, Adler, Huss.

4. *Volatilisation of Iodoform.* Methods: Jaworowski, Morpurgo.

The author rejects all of these methods in favor of one proposed by Lehman, in which the extracted iodoform is decomposed by fuming nitric acid in the presence of an excess of silver nitrate of known quantity, and the excess of silver nitrate ascertained by titration; or by a method of his own, possessing, however, an advantage over that of Lehman, which depends on the decomposition of the iodoform by zinc dust, and titration of the zinc iodide formed with silver nitrate and potassium chromate solutions.

The Quality of Iodoform-gauze is determined by the following quantitative and qualitative tests:

1. The clear solution obtained by shaking 1 Gm. of the gauze with 20 Cc. of water must be colorless (absence of foreign coloring matter, picric acid),

(absence of free iodine).

2. The iodoform content is determined quantitatively in an ether-alcohol extraction of the gauze by one of the methods recommended by the author.

3. A portion of the ether-alcohol extraction of the gauze is evaporated, the residue heated to complete volatilization of the iodoform, and then tested for the fixing material employed in the preparation of the gauze. If glycerin, this is soluble in water and alcohol. If resin, castor oil, or paraffin oil, turbidity results on addition of water in excess to the alcohol.

4. The residual extracted gauze is washed with 70 per cent. alcohol until perfectly colorless, then dried and weighed on a tared filter. The weight of this and of the iodoform found, deducted from the original weight, gives approximately the amount of fixing material in the gauze.

5. The size of the meshes of the gauze is ascertained by means of a thread-counter.—Pharm. Ztg., Feb. 1, 1902, 91; from Pharm. Post., 1901, No. 51.

CHARTÆ.

Highly Sensitive Test Papers—New Method of Preparation.—Dr. Heinrich Zellner has invented a new method of preparing test papers which have proven extremely sensitive and are particularly adapted to bacteriological examinations, as well as in certain chemical investigations, water analyses, etc., for which highly sensitive reagent papers are a desideratum. The new method consists essentially in the application of solutions of the required reagent upon paper, the surface of which is coated with a dark color, that contrasts strongly with the color of the reaction. Thus, a highly sensitive paper is produced by applying an alcoholic solution of fluoresceine, emulsioned with shellac, upon paper to which a black color has been given with a neutral coloring substance. On applying to such test paper a drop of a solution containing mere traces of ammonia or other free alkali, an extraordinarily handsome fluorescence is developed, which evidences itself by a luminous green color on the dark ground. This reagent is so sensitive that even traces of ammonia amounting to 1:1,000,000 are revealed by it, and it is consequently too sensitive for ordinary alkalimetical determinations. But the idea of providing a suitable dark underground for the more ready visibility of color reaction admits of wider application in various directions. The method has been patented in Germany.—Pharm. Ztg., July 24, 1901, 592.

COLLODION.

Collodion—Historical Note.—Prof. Kahlbaum calls attention to the fact that, although up to the present time the encyclopedias all give the credit for the discovery of collodion to Dr. Maynard, of Boston, the actual dis-

ether containing alcohol, but as early as 1846 suggested its medicinal uses, and urged surgeons to make experiments with it, in the directions pointed out by him, in the treatment of wounds. In consequence, the new method of "handling wounds by Schoenbein's process" was common talk in the city of Geneva in February, 1847, and within a month thereafter Prof. Karl Gustave Jung, in his lectures, dilated on a great number of clinical cases in which the collodion treatment of wounds might advantageously be used.—Nat. Drugg., Jan., 1902, 8; from Münch. Med. Wchschr.

Collodion—Cause of Variation in Viscosity.—In reply to a "query" concerning the cause of variation in the viscosity of collodion when recently prepared according to the U. S. P., Frederick T. Gordon states that the fault doubtless lies with the gun-cotton, for there is a wide variation in quality in the commercial article offered. Such unduly "thick" collodion may, however, assume the proper condition by aging. From a certain batch of gun-cotton a collodion may be made that is almost jelly-like, yet when this is allowed to stand for some time it will gradually become fluid. From information obtained, it is the practice of a prominent manufacturer to allow his collodion to age for at least six months before sending it out. The same manufacturer states that he finds it an advantage to increase the proportion of alcohol slightly over that required by the U. S. P. This secures a more limpid preparation, and thickening rarely results except from the loss of solvents by evaporation.—Proc. Pa. Pharm. Assoc., 1901, 124.

Collodium Flexile, B. P.—Construction of Formula.—W. Lyon calls attention to the practical convenience that would result if the B. P. directed that the collodion also should be weighed, as is now directed for the castor oil and balsam of fir. The container having been tared for the reception of the last two ingredients, it would require the additional weighing of nine and a quarter ounces of collodion instead of measuring 12 fluid ounces as directed in the official formula. This would not alone have the advantage of convenience, but would also insure that all of the collodion necessary would be contained in the product.—Pharm. Journ., Aug. 24, 1901, 274.

Collodion of Belladonna, B. P. C. F.—Improved Formula.—The Formulary of the B. P. C. directs the preparation of a collodion of belladonna from the green alcoholic extract of belladonna leaves so that the finished preparation shall have a green color. George F. Merson gives various reasons why this preparation should be prepared, as are seven official B. P. belladonna preparations, from the standardized liquid extract, which contains 0.75 per cent. of alkaloids, the green color being supplied by a *liquid chlorophyl* of commerce, and suggests the following formula: Mix

(British) commerce. Allow to stand for twelve hours, decant, filter "foots," and dissolve in the decantate and filtrate 120 grains of camphor and one-half oz. of pyroxylin. The product should measure one pint (= 20 fl. ozs. imperial measure), and is a brilliant and elegant preparation, equal in every respect to that made by the B. P. C. Formulary process from the green leaf extract, and with very much less trouble.—Pharm. Journ., Mar. 22, 1902, 234.

Phenolcelluloid—A New Form of Collodion.—Désesquelle, taking advantage of the solubility of collodion cotton in a mixture of phenol and camphor, obtains a homogeneous, viscous, collodion like fluid, which readily forms a tenaciously adhering film when applied to surfaces, which is far more resistant than the film produced by ordinary collodion.—Pharm. Ztg., Oct. 23, 1901, 850: from Nouv. Rem., 1901, No. 19.

ELIXIRES.

Aromatic Elixir—Improved Formula.—J. M. Parry recommends the following formula for aromatic elixir:

Oil orange peel.....	100 Mm.
Oil caraway.....	6 Mm.
Oil Ceylon cinnamon.....	6 Mm.
Oil coriander.....	6 Mm.
Oil anise (Russian).....	3 Mm.
Deodorized alcohol.....	38 fl. oz.
Syrup.....	40 fl. oz.
Water, enough to make.....	128 fl. oz.

Mix the oils with the alcohol. Add the syrup gradually in several portions, shaking well after each addition. Then heat the water to 140° F., and add it gradually. When cool, filter, clearing with precipitated calcium phosphate. Do not use magnesium carbonate, as it not only darkens the elixir but forms a compound with the cinnamic acid of the cinnamon oil.—Western Drugg., Jan., 1902, 8.

Simple Elixir—Improved Formula.—H. C. Bradford recommends the following formula for a simple elixir, which is bright, sweet and well flavored, and preferred on this account as a base for certain other elixirs for which he gives formulas:

Tincture of sweet orange.....	200 Cc.
Alcohol.....	800 Cc.
Glycerin.....	1000 Cc.
Precipitated calcium phosphate.....	60 Gm.
Water, enough to make.....	4000 Cc.

Add the alcohol to the orange tincture, then the glycerin in several por-

tions, agitating well after each addition, and afterward in the same manner add 1200 Cc. of water. Add the calcium phosphate, shake well, then filter through a wetted filter, returning the first portion of filtrate until it runs through clear. Finally pass through the filter enough of a mixture of alcohol, 1 volume, and water, 3 volumes, to bring the product to the measure of 4000 Cc. The

Tincture of Orange for this purpose is made by macerating 150 Gm. of the fresh grated rind of well flavored oranges in 500 Cc. of deodorized alcohol. Using the elixir obtained according to the above formula, the author recommends the preparation of the following :

Anodyne Elixir: Deodorized tinct. opium, 12 ½ drachms ; simple elixir, enough to make 12 ounces.

Elixir of the Chlorides of Mercury, Arsenic and Iron: Mercuric chloride, 1 grain ; solution of arsenic chloride, 1 fl. oz. ; tincture of ferric chloride, 2 fl. ozs ; simple elixir, 4 fl. ozs ; water, enough to make 16 fl. ozs.

Elixir of Hypophosphites: Calcium hypophosphite, 384 grains ; sodium hypophosphite, 128 grains ; potassium hypophosphite, 128 grs ; dilute hypophosphorous acid, 2 fl. dr. ; simple elixir, 6 fl. ozs. ; water, enough to make 16 fl. ozs. The salts and acid are dissolved in 8 fl. ozs. of water, filtered, and sufficient water passed through filter to make, with the elixir, the required measure.—West. Drugg., July, 1901, 350.

Compound Elixir of Hypophosphites—Formula.—H. C. Bradford suggests the following for preparing a compound elixir of hypophosphites corresponding in strength to the official (U. S. P.) syrup :

Calcium hypophosphite	45 Gm.
Potassium hypophosphite	15 Gm.
Sodium hypophosphite.....	15 Gm.
Dilute hypophosphorous acid	10 Cc.
Water	500 Cc.
Aromatic elixir, enough to make	1000 Cc.

Dissolve the salts in the water with the aid of the acid, add the aromatic elixir and filter.—West. Drugg., June, 1902, 303.

Elixirs—Saccharin as a Sweetening Agent.—H. C. Bradford observes that unless some change be made in the present formulas for elixirs so as to improve them both in appearance and taste, the bulk of the elixir business will go to the manufacturer. A combination of aromatics, while serving well as a corrective and adjuvant, is powerless to overcome the persistent bitter taste that is characteristic of many drugs usually exhibited in this form. He has found saccharin (using that marketed under the trade name "Garantose") to be the only agent that will accomplish this satisfactorily, and since using this finds that his elixirs please both physician and patient better than when made without. As an example he gives the following formula for

Iron pyrophosphate, soluble.....	250 gr.
Quinine sulphate	64 gr.
Strychnine sulphate.....	2 gr.
Solution of saccharin	4 fl.oz.
Alcohol.....	2 fl.oz.
Water	2 fl.oz.
Aromatic elixir, enough to make	16 fl.oz.

Mix the alcohol with 1 ounce of water, and in it dissolve the alkaloids, using heat, if necessary. Mix the solution of saccharin with the remaining water, and in it dissolve the iron salt, without heat. Should solution be too slow, a few grains of sodium citrate will be found materially to hasten the process. When solution is complete, mix with the alkaloidal solution, shaking vigorously. Now add 4 drams of purified talcum and 8 ounces of aromatic elixir. Shake well; set aside for a few days, and filter, making the filtrate measure 16 ounces by the addition of aromatic elixir. The clear, green elixir so produced keeps well, tastes well, and is in every way satisfactory. The

Solution of Saccharin, which the author keeps as a stock preparation, is made by dissolving 4 drachms of saccharin ("Garantose") in enough water to make 16 fl. ozs. by the aid of 2 drachms of C. P. sodium bicarbonate. Each fluid ounce of this is equal to one pound of sugar in sweetening power, and a little of it will make a vast difference in the taste of an ordinary elixir.—West. Drugg., Nov., 1901, 596.

In a subsequent paper, Mr. Bradford gives the following additional "improved" formula for elixir:

Compound Elixir of Apium Graveolens:

Take of—

Fld. ext. coca	2 oz.
Eld. ext. kola	2 oz.
Fld. ext. celery seed	2 oz.
Fld. ext. black-haw	2 oz.
Aromatic spirit.....	1 oz.
Alcohol	3 oz.
Solution of saccharin (see above).....	3 oz.
Aromatic elixir, enough to make.....	24 oz.

Mix, let stand one week (or longer) and filter through talcum. Each fluid drachm contains 5 grains of each of the active ingredients. Made in this way it conforms in strength to a proprietary compound of the same composition.

Compound Elixir of Cascara Sagrada :

Take of—

Fluid extract cascara sagrada.....	2 oz.
Fluid extract senna	1½ oz.
Fluid extract juglans.....	1 oz.
Fluid extract hyoscyamus.....	¼ oz.
Pure talcum	½ oz.
Solution of saccharin (see above).....	3 oz.
Aromatic elixir, enough to make.....	16 oz.

Mix, let stand two weeks (or longer) and filter. The elixir made in this way forms a slight sediment on standing, but this appears on examination to be quite inert. It gives excellent satisfaction.

Elixir of Lactated Pepsin is made according to the following formula :

Take of—

Scale pepsin	128 gr.
Pancreatin.....	64 gr.
Diastase.....	9 gr.
Hydrochloric acid	6 gtt.
Lactic acid.....	12 gtt.
Compound tincture of cardamon.....	2 oz.
Tincture of cudbear	2 oz.
Elixir of orange, enough to make..	16 oz.

The glycerin, water, and acid are mixed, the solids dissolved in the mixture, the wine added, and allowed to stand during two weeks before filtering, shaking the mixture frequently.—West. Drugg., Feb., 1902, 59.

Elixirs—New Formulas.—John H. Haydon, Jr., communicates the following formulas for several new elixirs, which have proved satisfactory :

Elixir Heroin :

Take of—

Heroin	10¾ gr.
Alcohol, deodorized	fl. ʒ viij
Brandy, French	fl. ʒ ½
Syrup	fl. ʒ xij
Water enough to make.....	Oij.
Compound tincture of curcuma (see "Tinctura").....	fl. ʒ i

Dissolve the heroin in the alcohol, add the other ingredients in the order given, and filter. Each fluid drachm contains ¼ grain heroin.

Elixir Heroin and Terpin Hydrate :

Take of—

Heroin	10¾ gr.
Terpin hydrate.....	256 gr.
Saccharin	10 gr.
Alcohol, deodorized	fl. ʒ xij
Glycerin	Oi.
Brandy, French	fl. ʒ iv
Compound tincture of curcuma (see "Tinctura").....	fl. ʒ i
Water enough to make.....	Oij.

Dissolve the heroin, terpin hydrate and saccharin in the alcohol; add the other ingredients in the order given, and filter. Each fluid drachm contains of heroin $\frac{1}{4}$ grain, of terpin hydrate 1 grain

Elixir Saw Palmetto and Santal Comp.:

Take of—

Saw palmetto berries.....	℥ viij.
Corn silk.....	℥ viij.
Sandalwood.....	℥ ij.
Sugar.....	℥ vi.
Alcohol,	
Water, each enough to make.....	Oij.

Mix twelve fluid ounces of alcohol with thirty-six fluid ounces of water. With this menstruum moisten the previously ground drugs and macerate during twenty-four hours. Then pack firmly in a percolator and pour on the remainder of the menstruum, allowing the percolate to drop slowly. In this dissolve the sugar by agitation. Finally pass sufficient water through the exhausted drugs to make the finished elixir measure two pints. Caramel may be added if the color is not deep enough. Each fluid ounce of this elixir is taken to represent saw palmetto berries, 120 grains; corn silk, 120 grains; sandalwood, 30 grains.

Elixir Sodium Salicylate Comp. (Elixir Acid Salicylic Comp.). Take of:

Salicylic acid.....	℥ xv.
Sodium bicarbonate.....	℥ xi.
Potassium iodide.....	cclvi gr.
Fluid extract black cohosh.....	cclxix m.
Fluid extract yellow jasmine.....	cclxix m.
Alcohol.....	fl. ℥ i
Compound syrup of sarsaparilla, U. S. P.....	fl. ℥ x
Water, enough to make.....	Oij.

Add the sodium bicarbonate to the water, followed by the salicylic acid in divided portions. When effervescence has ceased add the remaining ingredients in the order given; set the mixture aside for twelve hours. Finally filter. Each fluid drachm represents salicylic acid $3\frac{1}{2}$ grains, black cohosh 1 grain, yellow jasmine 1 grain, potassium iodide 1 grain, sodium bicarbonate x .—Amer. Drug., July 22, 1901, 37.

Elixirs Containing Bismuth—Improved Formulas.—John L. Godwin finds the published formulas for elixirs containing bismuth to be generally unsatisfactory, owing to the use of bismuth and ammonium citrate. By slight variations from the National Formulary and the use of a glycerite of bismuth and sodium tartrate, he obtains satisfactory preparations. Leaving out the directions, the following are the proportions of ingredients in the elixirs named:

Strychnine sulphate.....	1¼ gr.
Glycerite of bismuth and sodium tartrate (Caspari's Pharmacy) ..	2 oz.
Water	2 oz.
Aromatic elixir, enough to make.....	16 oz.
Tincture curcuma, enough to color.	

ELIXIR OF LACTATED PEPSIN AND BISMUTH.

Pepsin (U. S. P.)	75 gr.
Pancreatin, pure	8 gr.
Diastase	8 gr.
Glycerite of bismuth and sodium tartrate (Caspari's Pharmacy)...	2 oz.
Glycerin	2 oz.
Water	2 oz.
Tincture cudbear.....	2 dr.
Aromatic elixir, enough to make	16 oz.

ELIXIR OF LACTATED PEPSIN, CALISAYA, IRON AND BISMUTH.

Iron phosphate	128 gr.
Compound pepsin powder (without acid).....	320 gr.
Glycerite of bismuth and sodium tartrate (Caspari's Pharmacy) ..	2 oz.
Water.....	1 oz.
Elixir calisaya, detannated, enough to make.....	16 oz.

—West. Drugg., April, 1902, 183.

EMPLASTRA.

Green Belladonna Plaster, B. P. C. F.—Improved Formula.—George F. Merson suggests that the green belladonna plaster of the B. P. C. Formulary be prepared from the liquid extract of belladonna, instead of the green extract of belladonna leaves, the green color being communicated to the preparation by the addition of liquid chlorophyll (a preparation obtainable in British commerce, Rep.). This is in line with the author's suggestion in regard to "Collodion of Belladonna, B. P. C. F." (which see). The following is the formula suggested: Liquid extract of belladonna, 4 oz. Evaporate to 1 oz., and add: liquid chlorophyll, ½ oz.; resin plaster, enough to produce 12 oz. Mix. The resultant plaster, being made from a standardized liquid extract, does not require the complicated assay process described in the Formulary, and corresponds to that preparation in alkaloidal content.—Pharm. Journ., March 22, 1902, 254.

EMULSA.

Emulsions—A Wrinkle in Dispensing.—John H. Haydon, Jr., remarks that when prescriptions call for an oil to be emulsified and afterwards diluted with other ingredients, the regular amount of gum arabic must be increased accordingly. He finds the proportion of one drachm of fine powdered gum arabic to four fluid drachms of oil and sufficient water to make one fluid ounce to prove uniformly satisfactory, but for each addi-

should be added (7 Kep.). The thing to be avoided in making any emulsion is using the oily graduate to measure other ingredients. A clean one should always be taken.—Amer. Drugg., Sept. 23, 1901, 169.

EXTRACTA.

Solid and Fluid Extracts—Possible Utility of Wood Alcohol for Their Preparation.—Frederick T. Gordon, leaving the toxicity or non-toxicity of pure methyl alcohol out of consideration, has made a series of experiments with the purpose of ascertaining its relative value for the extraction of a number of narcotic drugs in preparing solid and fluid extracts. He found these preparations made with it to be practically of the same strength as regards extraction, active principles, as those prepared officially with ethyl alcohol. In several cases the amount of inert extractive was smaller than in the officially made preparation, the resulting extracts being more brittle and easier to powder. Since none of the methyl alcohol remains in the solid extract, the question of using it for the preparation of them seems to be worthy of consideration. Even in the case of narcotic fluid extracts, the dose being small, the amount of methyl alcohol administered would probably not be hurtful. The drugs experimented on were: Aconite, belladonna, cannabis indica, capsicum, conium, digitalis, nux vomica, hyoscyamus, stramonium, and veratrum viride.—Proc. Pa. Pharm. Assoc., 1901, 117-119.

Extracts and Fluid Extracts—Advantages and Disadvantages of Acetic Acid over Alcohol as Menstruum.—In reply to a "query," Frederick T. Gordon points out some of the advantages and disadvantages of using acetic acid in place of grain alcohol for preparing solid and fluid extracts. The chief advantages in favor of the use of acetic acid are the lesser cost and the better exhaustion of drugs containing alkaloids. An acetic extract of belladonna, for instance, represents the drug physiologically far better than the most carefully made alcoholic extract by the test of actual use. The same is true of ipecac, and even non-alkaloidal drugs yield extracts with acetic acid that are preferable to those made by the customary processes. Thus acetic acid extract of gentian gives us an ideal excipient for pill masses. A further advantage from the use of acetic acid as a menstruum would consist in the lesser precipitation on mixing fluid extracts with water, when compounding prescriptions, and the consequent less unsightly doses. The greatest disadvantage is the greater amount of inert extractive matter in the acetic acid extracts. In the author's experience both solid and fluid extracts made with acetic acid leave nothing to be desired in the way of appearance, yield, efficacy, and keeping qualities. A 10 per cent. aqueous solution of acetic acid will afford a menstruum effective for exhaustion and preservation.—Proc. Pa. Pharm. Assn., 1901, 122-124.

pose of determining the comparative value of acetic acid and of the official (alcoholic) menstruum for preparing solid extracts. Acetic acid as a menstruum was tried first on nux vomica, upon which drug Dr. Squibb has shown that this acid acts as a particularly effective and thorough menstruum. As was expected, the acid exhausted the drug readily and extracted but a slight amount of fatty matter, but on evaporation the quantity of extractive obtained was abnormally large. In the place of 12 to 14 per cent. of extractive, as yielded by the pharmacopœial menstruum, there was obtained 26 to 33 per cent., which contained 8 to 9 per cent. of alkaloids in place of 16 to 17 per cent. obtained from the same drug by the official menstruum. A series of experiments were next undertaken to ascertain the amount of the acetic extract soluble in the official menstruum. It was found that when this extract, in a powdered condition, was treated with the official menstruum, about half of it dissolved, and the dissolved portion on re-evaporation yielded an extract corresponding in all respects to that obtained by the official process; that is to say, containing about 16 per cent. of total alkaloids. The experiments were next extended to a number of drugs selected from the official lists, requiring different strengths of alcoholic menstrea, and of varied therapeutic action. Omitting the details, it may be mentioned that in several instances the drug was exhausted by the acid very quickly. Indeed, the limited quantity of percolates obtained suggests that a line of 50 per cent. acetic tinctures would be much more practicable than the corresponding 50 per cent. alcoholic tinctures. The results are exhibited in the following table:

Drug.	Quantity of percolate obtained. Cc	Extract from 150 grams of drug. Grams.	Equivalent from 100 grams of drug.	Alcoholic extract equivalent to 100 grams of drug.	Average yield of extract by U. S. P. menstruum. Per cent.	U. S. P. menstruum. Alcohol.	Remarks.
Aconite.....	350	90	36	30.4	10-12	92 percent.	Acetic extract slightly lighter in color. No acetic odor.
Arnica root...	370	60	24	20	20-24	Diluted.	Acetic extract darker in color. Odor acetic.
Bellad'na leaf.	340	56	22.4	19.2	22-26	2-3 by vol	Acetic extract slightly darker in color. Faint acetous odor.
Cimicifuga...	390	56	22.4	9.6	12-15	92 percent.	Strong acetic odor in extract.
Cinchona.....	385	56	22.4	22.4	20-25	¾ by vol. and dil.	Acetic extract not quite as dark. No acetous odor.
Euonymus...	325	100	40.0	32.0	.....	2-3 by vol	Acetic extract slightly lighter in color. No odor.
Juglans.....	250	52	....	....	15-22	Diluted.	No marked difference in odor or color.
Leptandra....	250	90	36	27.2	30-36	¾ by vol.	Slight acetic odor in ext. No difference in color.
Podophyllum..	325	57	22.8	14.4	16-22	4-5 by vol.	Strong acetic odor in extract.
Rhubarb.	250	60	24	17.6	.....	4-5 by vol.	No difference in appearance.

Drug. Circ., Sept., 1901, 180.

process similar to that of the Pharm. Germ. IV, does not form a clear solution, according to the experience of J. C. Lensden. He finds, however, that a perfectly soluble and in every way unexceptionable extract may be obtained, if the Curaçao aloe is dissolved in ten times its weight of water by the aid of heat, then mixed with the same quantity of water, allowed to cool and stand for 24 hours, and then evaporating (the filtrate ? Rep.) to dryness. The yield averaged 70 per cent., whereas Cape aloes only yields 57 per cent. on an average.—Pharm. Ztg., March 5, 1902, 179; from Pharm. Weekbl., 1902, No. 4.

Extract of Colocynth—Assay.—Dr. Walter Braeutigam recommends the following method for determining the percentage of colocynthin in extract of colocynth: The finely powdered extract is exhausted with alcohol at 20° to 25° C., the solution filtered and evaporated to dryness. The residue is pulverized and extracted with water at a moderate temperature until the latter no longer acquires a yellow color. The aqueous filtrate is then treated with lead acetate, then with basic lead acetate, the solution is filtered, and the excess of lead precipitated by excess of aluminum sulphate. A little animal charcoal is now added, and the mixture evaporated on the water-bath to dryness. The residual mixture of colocynthin, lead sulphate and aluminum salts, is now shaken out with ether several times (the ether solution being rejected) and then exhausted with alcohol at 20°–25° C.; the filtrate is evaporated, the dry residue dissolved in a little absolute alcohol, and this solution filtered, returning the filtrate to the filter until it passes perfectly clear. It is then evaporated, dried and weighed. The product, although slightly colored, has all the chemical and physical properties of pure colocynthin. A good extract should contain about 4 per cent. of colocynthin, but extract of colocynth must necessarily vary since the yield of extract is from 10 to 20 per cent. of the drug employed.—Pharm. Ztg., April 23, 1902, 316.

Extract of Gentian, B. P.—Suggestions for an Improved Process of Preparation.—Henry G. Greenish and Walter Henry Senton have conducted a series of experiments on the preparation of extract of gentian, the results of which, together with a resumé of the literature of the subject, are communicated in a paper presented to the Pharmaceutical Society of Great Britain. They selected extract of gentian for these experiments because recent researches on the constituents of the root indicated that the official (B. P.) method of preparing the extract was not the best, and because this official process differs in principle from that official in many other countries, notably the United States, Germany, France, Austria and Switzerland. According to the B. P. process, gentian root is infused for ten hours in ten times its weight of distilled water, then boiled for fifteen minutes, the liquid decanted, expressed and strained, and then evaporated

sufficiently exhaust the gentian root of its bitter principle. (2) That the boiling to which the root is subjected is disadvantageous in that a larger amount of pectin is dissolved than when cold extraction is used. (3) That extraction with cold water is preferable, two successive infusions being necessary. (4) That although 45 per cent. alcohol thoroughly exhausts the bitter principle, the extract obtained on evaporation of the tincture has the disadvantage of being hygroscopic. (5) That the exhaustion of the root with cold water proceeds slowly. (6) That the infusions obtained from the whole root by the cold extraction process filter more readily than when the sliced root is used. (7) That gentian root is not, in their opinion, well adapted for percolation with water. Their conclusions lead them to suggest the following process for adoption in the next edition of the B. P.:

Infuse gentian root in five times its weight of distilled water for forty-eight hours; pour off the infusion; press the marc; strain the expressed liquid; mix the liquids, and concentrate them to one-third their volume; filter when cold. Infuse the marc for twenty-four hours with a further quantity of distilled water equivalent to three times the weight of gentian root taken; repeat the process of decantation, expression, concentration, etc. Mix the two concentrated liquids and evaporate to the consistence of a firm extract.—Pharm. Journ., April 5 and 19, 1902, 275-277 and 319-321.

Extract of Licorice—Glycyrrhizin Content when Made by the B. P., Process.—The statement in Attfield's chemistry (15th edition) that "Glycyrrhizin is only slightly soluble in cold water, hence is almost wholly excluded from the official evaporated infusion (Extractum Glycyrrhizæ, B. P., or Extractum Glycyrrhizæ Liquidum, B. P.), but is present in considerable quantity in the evaporated decoction," has led D. B. Dott to make some practical experiments, the results of which are communicated in a note. The B. P. directs the extract to be prepared by macerating the root with a limited amount of cold water, and by expression, but Mr. Dott observes that in practice it is probably always prepared by percolation with cold water till nearly exhausted. In the experiment, powdered licorice root was macerated with cold water and percolated with the same solvent during several days, till apparently quite exhausted, and the glycyrrhizin determined in the extract obtained; another sample of the same powdered root being treated exactly according to the official directions, and the glycyrrhizin determined in the same manner as in the first case. The percentage of glycyrrhizic acid determined in the first case was 6.98 per cent. calculated on the root, while the quantity present in the officially prepared extract amounted to 3.89 per cent. of the root. The glycyrrhizin is therefore not wholly excluded from the officially pre-

pared extract of licorice, and in practice is probably even greater than that indicated because of rational modifications adopted. The proportion of glycyrrhizin in licorice root, given by Sestini (6.37 per cent.) and others, corresponds well with that obtained in the first experiment.—Pharm. Journ. March 22, 1902, 239.

Extract of Licorice—Examination of Various Brands.—W. Van Rijn gives the results of an examination of various brands of stick licorice used in Holland, as follows :

Brand.	Weight.	Moisture.	Ash.	Glycyrrhizin.	Insoluble in Cold Water.
Cassano	55 Gm.	15.7	4.0	6.0	31.0
Muzi	31 Gm.	16.0	5.2	8.5	24.5
Duca di Atri.....	47 Gm.	15.3	6.0	10.5	28.0
Longo	58 Gm.	15.15	5.5	11.0	(?)
Santi Franco	36 Gm.	17.0	5.7	13.0	21.0
Salvago	38 Gm.	20.8	6.3	13.5	31.0
P. S. Italy.....	30 Gm.	17.7	5.6	14.5	21.3
Baracco	57 Gm.	15.5	4.6	15.0	29.7

All the samples were free from copper and starch.—Pharm. Journ., Mar. 1, 1902, 173 ; from Pharm. Weekbl., 39, 64.

Extract of Taraxacum—Preparation from the Dried Root.—Prof. L. E. Sayre has made experiments to determine the availability of dried taraxacum root in place of the fresh drug for preparing the extract. According to a recent analysis of roots gathered in September, undertaken for the present investigation by L. D. Havenhill, the constituents of the dried drug are the following :

Ash	9.30
Fatty material.....	2.30
Resin and resinoid	1.40
Bitter principle (crude).....	1.50
Organic acid.....	1.20
Glucose extractive (sol. in alcohol)	4.50
Inert extractive (sol. in 60 per cent. alcohol)	24.30
Gum	11.50
Colored extractive and albuminoids	7.00
Coloring matters (sol. in water).....	2.00
Starchy matter	8.50
Cellulose	9.00

The bitter principle appears in the chloroformic extractive. This extractive when deprived of fat and resin yields to water the bitter principle, which is a simple bitter (not aromatic). This principle (taraxacin) with the salts of the organic acids, and inorganic salts are the main medicinal constituents. An extract which would contain only these would be im-

and such a one is suggested for the next Pharmacopœia. For comparison, three kinds of extract were prepared from the carefully dried root, namely, by the use of water, diluted alcohol and alcohol. These on examination showed the following yields:

Aqueous extract (of pilular consistency)	64.90
The same, dried at 110° C.....	49.52
Diluted alcohol extract (of pilular consistency)	50.06
The same, dried at 110° C.....	33.98
Alcoholic extract (of pilular consistency)	15.8
The same, dried at 110° C.....	10.81

An aqueous solution of these extracts was made for the purpose of bringing out the taste, etc., for comparison. The aqueous extract had a decided caramel odor and burnt taste. Not so with the other two. The diluted alcohol extract represents very well the constituents of the root almost without the caramel flavor, and has not the objectionable features of the aqueous extract. Therefore it is suggested by the author that the dried root and *diluted alcohol* be directed for preparing extract in the next Pharmacopœia. Indeed, it might be made by simply evaporating the fluid extract to a pilular consistency under proper restrictions as to temperature.—Drug. Circ., Mar., 1902, 48.

EXTRACTA FLUIDA.

Fluid Extracts from Green Drugs—Preparation.—G. L. Tinker gives his experience in the preparation of fluid extracts from green drugs since he first made the attempt in 1868, and he finds it perfectly feasible to prepare such representing uniformly one pound of the green drug in a pint. To crush the drug he employs a large iron mortar and pestle, weighing 134 pounds, and a very strong iron press. In some cases pure alcohol is used, in others more or less water is added, the aim being to have each fluid extract to contain not more than 50 per cent. of alcohol to preserve it. To fully extract the virtues of resinous drugs, like mandrake, spikenard, elecampane, etc., a portion of the alcohol is reserved and used for a second pressing. The two liquids are united and made up to the measure of a pint per pound by the addition of water or alcohol, according to circumstances. These preparations are all elegant in appearance, may be added to waters or mixed with each other without causing a precipitate, and they invariably retain the peculiar odor and taste and active properties of the drug they represent. They are so unlike the fluid extracts of the dried drug that no one not acquainted with them would recognize them by color, odor or taste. Some are not so strong as the same preparation of the dried drug, and some are very much stronger, but all are sufficiently concentrated for all practical purposes. In fine, the author is convinced

Fluid Extract of Aconite Root—Satisfactory Method of Assay.—Adopting the suggestion of Lyman F. Kebler to employ ether-chloroform and ammonia for the extraction of the drug in the assay of aconite root and leaf, but substituting sodium bicarbonate for the ammonia, A. R. L. Dohme and H. Engelhardt have devised the following satisfactory method for the assay of fluid extract of aconite root: 10 Cc. of the extract was mixed with about 5 Gm. of oak saw-dust, and the alcohol removed by moderate heat. The saw-dust was then transferred to a 6-oz. bottle, 75 Cc. of ether, 25 Cc. of chloroform and 10 Cc. of a 5 per cent. sodium bicarbonate solution added, and the mixture shaken well for some minutes. After standing for 2-3 hours, the mixture was shaken once more, and after becoming clear 50 Cc. of the fluid were poured off into a separator and shaken with three successive portions of 25, 20 and 15 Cc. of 2 per cent. sulphuric acid. The combined acid solutions were rendered slightly alkaline with ammonia water, and shaken with three portions of 30, 20 and 15 Cc. of a chloroform-ether mixture (equal volumes). The chloroform-ether was evaporated at a low temperature, and the residue, after treating it twice with ether to expel last traces of ammonia, was titrated in the usual way with decinormal sulphuric acid and centinormal caustic potash, using hæmatoxylin as indicator.

The same results were obtained when using for extraction amyl alcohol instead of ether-chloroform. The resulting alkaloid was very pure, light yellow in color, and of a varnish-like consistence. An experiment made with Prollius' fluid as menstruum was not so satisfactory.—Pharm. Era, Aug. 1, 1901, 123.

Liquid Extract of Belladonna, B. P.—Preparation by a Process of Re-percolation.—In a paper read before the Chemists Assistants' Association, E. A. Andrews communicates the results of his experience with a modification of the B. P. process, which is essentially an adaption of the well-known process of re-percolation as described in Remington's "Practice of Pharmacy" (page 388). After using the method for several years he found it to answer admirably, the points in its favor being (1) that a batch of the liquid extract can be prepared in five days; (2) the periods of maceration are convenient; (3) a definite quantity of menstruum is used for the process; (4) the loss of spirit by evaporation during the process is reduced to a minimum; (5) the amount of alkaloids extracted is about the same as when strictly following the B. P. directions, but will vary slightly according to the condition of the drug; and (6) the same results are obtained when working on large or small quantities of the same batch of drug. The only disadvantage that he was aware of was that the process extracted a somewhat smaller percentage of total solids—a questionable

were construed ; also because belladonna root itself differs in the amount of extractive it contains, some samples giving a liquid extract containing as low as 9 per cent. of solids, whilst others contained as high as 18 or 19 per cent.—Pharm. Journ, April 19, 1902, 336.

The above observations of Mr. Andrews, induced Arthur W. Nunn to undertake a series of experiments, which, in the main, confirm those of Mr. Andrews.—*Ibid.*, May 31, 1902, 451.

Aromatic Cascara Sagrada—Use of Saccharin as a Sweetening Agent.—Frank Edel, by experiments covering a period of months, has demonstrated to his satisfaction that in order to produce aromatic cascara sagrada the equal of the best on the market it was necessary to sweeten the extract by the addition of saccharin in the proportion of 30 grains to the pint, and that without its use the production of a satisfactory preparation is impossible.—Amer. Drugg., Nov. 25, 1901, 311.

Ext. Cinchona Liquidum—Modification of the Assay Process of the B. P.—In order to remedy the difficulty usually experienced in the shaking-out process as considered by the B. P. process of assaying liquid extract of cinchona, F. H. Alcock recommends the following modification, which overcomes the troublesome emulsification of the alkaloid solution and the immiscible solvent : Five Cc. (or better, 5 Gm.) of the liquid extract are placed in a four-ounce round white glass bottle fitted with a good cork, 15 Cc. of benzolated amyl alcohol and 10 Cc. of normal alcoholic potash are added, the mixture well shaken and put into a warm place for a few minutes, giving an occasional vigorous shake. Then carefully decant the clear liquid into a separator, shake the residue twice, first with 15 and then with 10 Cc. of benzolated amyl alcohol, and transfer these portions also to the separator, carefully avoiding the presence of any of the slimy colored margin, which remains as residue. The liquid in the separator is now washed two or three times with 5 Cc. of water, with or without the addition of 1 Cc. of 10 per cent. ammonia by warming, thorough shaking, subsidence, and removal ; then, having cleared the alkaloidal solution of coloring matter, alkali, glycerin, etc., by this treatment, it is shaken out with dilute acid, and dilute acid solution of the alkaloid treated further in the manner directed in the B. P. The alkaloids as obtained by this modification of the B. P. process are nearly free from color, in beautiful crystals, perfectly soluble in cold dilute sulphuric acid, and in quantity correspond to that obtained by the official process.—Pharm. Journ., July 27, 1901, 90.

Detannated Fluid Extract of Cinchona—Commercial Quality.—W. R. Lamar has recently had occasion to examine three commercial samples of detannated fluid extract of cinchona, and was surprised that only one of

Below are tabulated the results obtained :

No.	Alkaloids.	Tannin.	Sulphates.	Chlorides.
1.....	5.23 per cent.	Absent.	Present.	.....
2.....	4.45 per cent.	Absent.	.....	Present.
3	0.50 per cent.	Present.	Absent.	Absent.

No. 1 was of a deep red-brown color, and was both artificially colored and flavored.

No. 2 was of an amber color and possessed a purely alcoholic odor, having none of the characteristic aroma of the bark.

No. 3 was of a deep greenish-brown color, had a pronounced acid reaction, and a peculiar odor somewhat suggestive of pyroligneous acid. This sample also contained iron.—Pharm. Era., Aug. 1, 1901, 123.

Liquid Extract of Coca—Percentages of Alkaloid in the Official (B. P.) and in Commercial so-called "Miscible" Preparation.—W. Garsed, referring to a previous paper by Prof. Collie and himself dealing with the determination of cocaine (see under organic bases), in which attention was called to considerable variation in the alkaloidal content of several samples of liquid extract of coca. Since then the author has obtained and examined fourteen other specimens, some of them being the B. P. article, and the other seven the so-called "miscible" preparation. The B. P. extracts were all distinctly acid to litmus, had a deep brownish color, and with the exception of No. 6, which was more fragrant than the rest, had a similar odor. They all formed slight deposits on standing, some more than others, but the deposits were proven to be free from alkaloid. The "miscible" extracts varied in color from deep brownish-red, opaque in an ordinary test-tube, to reddish-brown, just transparent in an ordinary test-tube. They were all distinctly acid to litmus, and all deposited considerably on standing. The assay of these several specimens was made in conformity with the observations made in the paper above referred to, and is described in detail, the results obtained being as follows :

GRAMMES OF TOTAL ALKALOID IN 100 CC. OF LIQUID EXTRACT OF COCA.

Number of Sample.	B. P. Extracts.	Miscible Extracts.
1.	0.816	0.014
2.	0.386	0.154
3.	0.368	0.026
4.	0.252	0.048
5.	0.200	0.294
6.	0.400	0.048
7.	0.240	0.054
Average.	0.380	0.091

—Pharm. Journ., Mar. 15, 1902, 214.

of conium, recommends the following as being convenient, accurate, and more expeditious than any he has tried: Into a separator measure 10 Cc. of the fluid extract and 2 Cc. of sodium hydroxide T. S. and extract by shaking out with 20, 10 and 10 Cc. of chloroform. From the united chloroformic solution extract the alkaloid by shaking with 20 Cc. of 1 per cent. sulphuric acid. Draw off and reject the chloroform. Render the acid aqueous solution remaining in the separator alkaline with 3 Cc. of sodium hydroxide T. S., and extract with 20, 10 and 10 Cc. of chloroform. To the chloroformic solution add 20 Cc. of water and 5 Cc. of decinormal sulphuric acid T. S. and shake thoroughly. Draw off and reject the chloroform. To the residual aqueous solution add cochineal T. S. and titrate with decinormal alkali. Multiply the number of Cc. of decinormal acid consumed by 0.0127, which gives the weight of alkaloid in 10 Cc. The author finds chloroform preferable to ether for the shaking out process, because it is not so liable to emulsify, and because it does not dissolve in, and is not dissolved appreciably by water. A determination can be completed in from 15 to 20 minutes by this method.—Pharm. Rev., June, 1902, 259-261.

Fluid Extract of Ergot—Improved Formula and Process.—According to W. Stoeder a very active fluid extract of ergot is obtained by percolating 100 parts of ergot, deprived of fat with petroleum ether and dried over lime, with a mixture of 80 parts of 70 per cent. alcohol and 20 parts of glycerin, followed by 70 per cent. alcohol until exhausted; reserving the first 85 parts of percolate and concentrating the exhaust percolate in a vacuum or at a temperature not exceeding 70° to 15 parts, and mixing this with the reserved portion. The completeness of exhaustion is determined by the faint red color of the percolate and the absence of ergotin, the latter being ascertained as follows: 2 Cc. of the percolate are diluted with 2 Cc. of water, 1 drop of ammonia is added, and the mixture is shaken with 5 Cc. of ether. On pouring the ether layer upon concentrated sulphuric acid a violet zone is produced at the line of contact if ergotin is present, but not if the percolate is free from it. Fluid extract of ergot obtained in this way is a clear, red-brown, faintly acid fluid, having a sp. gr. of 1.025-1.030, and contains at least 0.25 per cent. ergotin. —Pharm. Ztg., Feb. 1, 1902, 90; from Pharm. Weekbl., 1901, No. 50 and 1902, No. 2.

Aqueous Fluid Extract of Ergot—Preparation for Subcutaneous Use.—L. Delaya proposes the following process for preparing an aqueous fluid extract of ergot suitable for subcutaneous injections: 1000 Gm. of coarsely powdered ergot are moistened with water containing 1 Gm. of tartaric acid, allowed to stand 12 hours in a percolator, and then percolated with water containing 0.1 per cent. of tartaric acid until the percolate passes

thin syrupy consistence. Then 2 Gm. of calcium carbonate are added and enough 90 per cent. alcohol to produce a liquid of 70 per cent. alcoholic strength—about 600–700 Gm. being necessary. The precipitate which forms after vigorous shaking is allowed to subside, and filtered off after 12 hours standing. The alcohol is distilled at the lowest practicable temperature from the filtrate, the residual liquid is weighed, 300 Gm. of cherry laurel water added, and then enough distilled water to bring the total weight to 1000 Gm. The product is now mixed with 50 Gm. of pure dry animal charcoal, allowed to stand several hours, filtered, 1.5 Gm. of salicylic acid are added, allowed to stand another twenty-four hours, and again filtered. The filtrate is preserved in aseptic vials of 30 Cc. capacity, well stoppered, in a cool place, protected from light. It is a clear, brown, tolerably thin fluid, containing about 7.5 per cent. of dry extract, and is said to keep well.—Pharm. Ztg., May 7, 1902, 353; from Jour. de Pharm. d'Anv., April, 1902.

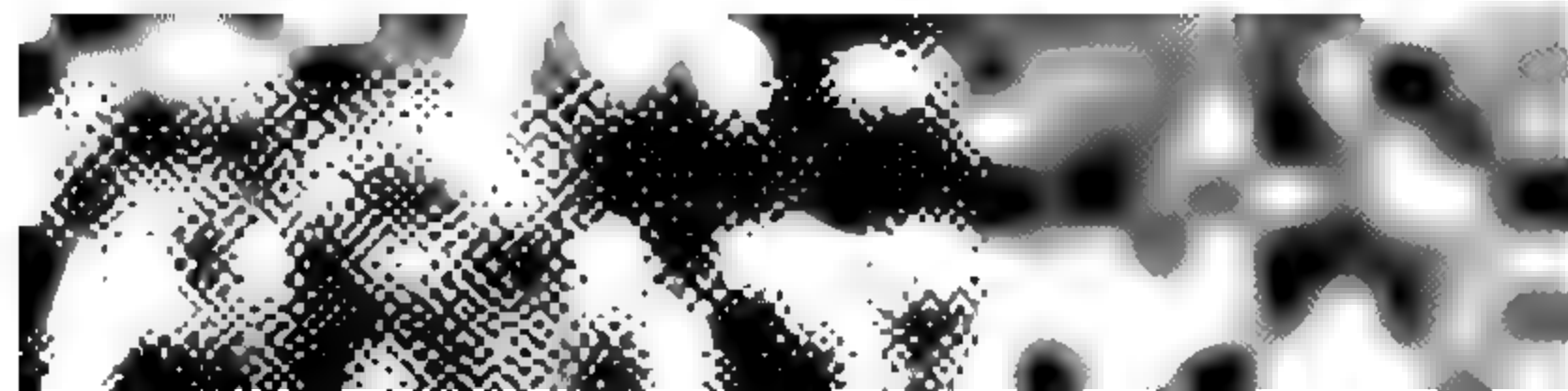
Soluble Extract of Ginger Ale—Formula for Fountain Use.—John A. Foote communicates the following formula for a soluble extract of ginger ale which produces, in the proportion of 4 oz. to a gallon, a soda water syrup that has the popular flavor and pungency :]

- . Jamaica ginger, in fine powder 8 lb.
- Capsicum, in fine powder 6 oz.
- Alcohol, a sufficient quantity.

Mix the powders intimately, moisten them with a sufficient quantity of alcohol, and set aside for four hours. Pack in a cylindrical percolator and percolate with alcohol until 10 pints of percolate have resulted. Place the percolate in a bottle of the capacity of 16 pints, and add to it 2 fluid-drams of oleoresin of ginger; shake, add 2½ pounds of finely powdered pumice stone, and agitate thoroughly at intervals of one-half hour for 12 hours. Then add 14 pints of water in quantities of 1 pint at each addition, shaking briskly meanwhile. This part of the operation is most important. Set the mixture aside for 24 hours, agitating it strongly every hour or so during that period. Then take

- Oil lemon..... 1½ fl. oz.
- Oil rose (or geranium) 3 fl. dr.
- Oil bergamot..... 2 fl. dr.
- Oil cinnamon..... 3 fl. dr.
- Magnesium carbonate 3 fl. oz.

Rub the oils with the magnesia in a large mortar and add nine ounces of the clear portion of the ginger mixture to which has been previously added two ounces of alcohol, and continue trituration, rinsing out the



mortar with the ginger mixture. Pass the ginger mixture through a double filter, and add through the filter the mixture of oils and magnesia. Finally pass enough water through the filter to make the resulting product measure 24 pints, or 3 gallons. The author also gives several formulas for making a "cheaper" extract, suitable for bottlers' use.—West. Drugg., July, 1901, 362.

Fluid Extract of Kola—Assay.—J. Warin recommends the following method for the assay of fluid extract of kola: 15 Gm. of the fluid extract are evaporated to about one-half to remove the alcohol, 2 Gm. of water are added, and 10 Gm. of magnesia stirred into the fluids so as to produce a homogenous mixture, which is transferred to a tared 200 Cc. flask after standing a short time. Now 150 Gm. of chloroform are added, the gross and net weights are ascertained, and the flask, attached to a reflux condenser, is heated for three-quarters of an hour to moderate ebullition of the contents. The original weight is adjusted with a little chloroform when the contents have cooled, the mixture is filtered, and 100 Gm. of the filtrate are evaporated to constant weight, which gives the percentage of crude alkaloid when multiplied by 10. The *crude alkaloid* is purified by dissolving it in 20 Gm. of diluted hydrochloric acid, by the aid of moderate heat, filtering the solution, rinsing the capsule and washing the filter, adding ammonia in excess to the filtrate and washings, and shaking out thrice with portions of 20 Gm. of chloroform, evaporating the united chloroformic solutions, drying, weighing and calculating as *pure alkaloid*.—Pharm. Ztg., May 3, 1902, 346; from Journ. de Pharm., 1902, xv, No. 8.

Fluid Extract of Nux Vomica—Removal of Oil.—While the U. S. P., 1890, directs the removal of oil from the solid extract of nux vomica, no such provision is made for the fluid extract, which, according to Ferdinand A. Sieker, separates oil on standing. This cannot be removed by filtration, and he, therefore, resorted to the following method for the preparation of the fluid extract, which eliminates the oil perfectly: One thousand parts of ground drug were practically exhausted by percolation with the U. S. P. menstruum, the alcohol was recovered by distillation and the residue evaporated to 500 parts. Forty parts of paraffin were added, and the mixture heated to 70° or 80° C., and briskly stirred for half an hour. It was then set aside for twenty-four hours in a place where it cooled slowly, so that the paraffin had a chance to rise to the surface before cooling. The congealed paraffin and what it carried with it was then removed, and the residual liquid treated again in the same way with thirty parts of paraffin. The two portions of paraffin were warmed and stirred with sixty parts of water acidulated with acetic acid, set aside to cool, the aqueous liquid separated and added to the more concentrated solution of extract; this was strained through closely woven muslin, carefully evaporated to 400 parts, and the percentage of dry extract determined by evaporation of an aliquot portion at 100° C.; then, for every 1 part of water present

adjusted to the official strength (1.5 Gm. in 100 Cc.).—*Amer. Journ. Pharm.*, April, 1902, 175.

Liquid Extract and Tincture of Nux Vomica, B. P., 1898—Causes of Turbidity and Remedy.—Henry G. Greenish and F. A. Upsher Smith, at the request of the Council of the Brit. Pharm. Society, have made a series of investigations to determine the causes of the turbidity of tincture of nux vomica, B. P., 1898, and, if possible, to suggest a remedy. The nature of these experiments are explained in a lengthy paper, in which they necessarily also consider the liquid extract of nux vomica, and incidentally the solid extract, and these lead them to the following conclusions:

(1) That the tincture of nux vomica, prepared as officially directed, may be bright at summer temperatures, but deposit when cooled.

(2) That this deposit is largely fatty matter.

(3) That nux vomica seeds contain from 2.6 to 4.7 per cent. of fat.

(4) That the precipitation of fat may be avoided by removing fat from the concentrated weak percolate before mixing it with the reserve percolate.

(5) That the removal of the fat is best effected by evaporating the weak percolate to one-third of its volume, filtering through paper and continuing the evaporation to the volume given in the British Pharmacopœia.

(6) That the use of kaolin does not effect the removal of fat better than paper alone; its use has the advantage that it hastens filtration.

(7) That the loss of alkaloid resulting from filtration may be neglected.

(8) That the resulting liquid extract, together with the tincture made from it, do not deposit fatty matter; a mixture prepared from the tincture is bright when made.

(9) That the process of repercolation presents a product loaded with fat, which cannot be removed by filtration through kaolin; moreover, the process is a slow one.

(10) That in our opinion the official method is the best for preparing the liquid extract, provided the improvement suggested in conclusion (5) be adopted.

(11) That a No. 20 powder is more suitable for percolating nux vomica seeds than either a No. 40 or a No. 50 powder.

(12) That the extract obtained from the modified liquid extract is easily reduced to powder.

We, therefore, suggest the following addition to the text of the British Pharmacopœia, page 118, under *Extractum Nucis Vomice Liquidum*: L. 11, bottom, delete the words "remove the alcohol by distillation; evaporate the residue . . ." Insert "distil until the alcohol has been removed and the liquid is reduced to one-third of its original volume; filter when cold; evaporate the filtrate . . ."—*Pharm. Journ.*, Dec. 14, 1901, 667-671.

proven popular and satisfactory in his experience :

Fluid extract of sarsaparilla.....	8 fluid ounces.
Fluid extract of stillingia, comp.....	16 fluid ounces.
Fluid extract of senna	6 fluid ounces.
Alcohol.....	16 fluid ounces.
Simple syrup	32 fluid ounces.
Potassium iodide.....	1 ounce av.
Water, enough to make	1 gallon.

Mix. Let stand two or three days. Shake well and filter. Another formula, which produces an efficient preparation at less cost, is the following :

Stillingia	8 ounces.
Sarsaparilla.....	8 ounces.
Burdock	3 ounces.
Blue flag.....	1½ ounces.
Podophyllum	1½ ounces.
Senna	1½ ounces.
Prickly ash bark.....	360 grains.
Potassium iodide	480 grains.
Dilute alcohol, sufficient.	

Mix the crude drugs ; reduce them to a coarse powder ; and extract them with dilute alcohol so as to obtain one gallon of percolate. In this dissolve the potassium iodide.—Bull. Pharm., Jan., 1902, 13.

LINIMENTA.

Soap Liniment—Improved Process.—Frank Edel suggests that the Committee on Revision of the U. S. P. could do no better than to recommend a formula for a soap made from oleic acid and soda for use in soap liniment. This liniment is still a bugbear with many pharmacists, largely on account of the fact that the soap used for its preparation is not a pure oleate.—Amer. Drugg., Nov. 25, 1901, 312.

Soap Liniment—Objection to the Use of Castile Soap.—Prof. L. E. Sayre observes that sodium stearate is abundant in so many of the castile soaps of the market that we are still having the perennial complaint, that soap liniment will gelatinize. Of course this will not occur if the so-called animal fats are absent. This difficulty suggests the propriety of making soap liniment in another way—that is, to form a soap directly from some suitable oil and caustic soda. The saponification equivalent of cottonseed oil with sodium hydroxide, according to Allen, is about 14 per cent., and that of castor oil about 13.4 per cent. That is, 100 parts of cottonseed oil will be saponified by 14 parts of caustic soda, and 100 parts of castor oil will be saponified by about 13.4 parts of the same alkali. It is

ingredients. Soap liniment made in this way—saponifying the oil in an alcoholic solution of the alkali—has proven quite satisfactory.—Drug. Circ., May, 1902, 92.

"Ready Liniment"—A Reliable Formula.—B. S. Cooban recommends the following formula for a liniment that has proven very popular with him: water of ammonia, 1 fluid drachm; chloroform, 1 fluid drachm; sulphuric ether, $\frac{1}{2}$ fluid ounce; oil of cloves, 2 fluid drachms; oil of saffras, 1 fluid ounce; oil of turpentine, $\frac{1}{2}$ fluid ounce; camphor 2 drachms; alcohol, 14 fluid ounces.—Bull. Pharm., April, 1902, 159.

LIQUORES.

Concentrated Liquors, B. P.—Criticism and Corrections of Certain Formulas.—At the Dublin meeting of the British Pharmaceutical Conference (1901) several papers were read in which the authors called attention to certain imperfections in the B. P. formulas for preparing liquor calumbæ conc., liquor senegæ conc., and liquor gentianæ compositus conc. F. C. J. Bird observes in reference to

Liquor Calumbæ Conc., which is made by maceration and expression, that the content of extractive will vary according to the kind of press used for the expression—the use of a powerful hydraulic press, for instance, such as is liable to be used on a manufacturing scale, securing a larger amount of extractive than is possible to obtain with the ordinary hand press. Variations in the amount of alcohol in the finished product, due to difference in manipulation and liability to incipient change by prolonged exposure, are also factors that exert a decided influence upon the product as prepared by the pharmacist or the manufacturer. The question then arises, shall a standard be established based on the product obtained on the manufacturer's scale or upon that obtainable under proper directions and precautions on the scale of the retail pharmacist. The author is of the opinion that the latter standard should be accepted, and if, on investigation, the formula or process should prove defective, it should be made known and corrected. It is clearly a desideratum in every official formula that it should furnish a uniform product under every condition of manufacture. In the case of the preparation under consideration, the following modification of the official process tends to this desirable end:

(1) The substitution of chloroform water for distilled water in order to prevent incipient fermentation or souring. A fresh aqueous infusion of calumba is neutral in reaction; even slight acidity causes turbidity and slow precipitation in the finished concentrated liquor. (2) The use of a quantity of chloroform water for the second maceration equal to the difference between the volume of the first pressings and 16 fl. oz. (in the B. P. formula), so that the mixed expressed liquids may measure 16 fl. oz.

(3) The removal of suspended matters, starch, etc. (often very considerable in amount) by allowing the mixed liquors to remain at rest for twelve hours, decanting the clear portion and washing the sediment with a little chloroform water. (4) The raising of the temperature ordered in the B. P. from 180° to 212° F., starch being absent, the liquid after heating being quickly cooled and made up with boiled distilled water to 16 fl. oz. before the addition of the spirit. Under these conditions the chloroform is completely dissipated, and the finished liquor free from its odor. On setting aside to clear, decanting, and filtering through a small filter, a finished product of 20 fl. oz. can be obtained without difficulty. Operating in clear liquor only in the process but little precipitation is produced by the spirit, and loss of alcohol is reduced to a minimum. The advantages of the higher temperature are that the final liquor filters more readily, is brighter and keeps better. The author furthermore mentions that the product so obtained does not represent the full amount of extractable matter or bitter principle. To this end slow percolation with chloroform water would be most effective. Experiments show that a "liquor" thus prepared contained 10.4 per cent. of extractive, out of a possible amount of 13.2 per cent. actually contained in a sample, whilst by the official process, as modified, only 7.4 per cent. of extractive was contained in a "liquor" from the same sample. With regard to

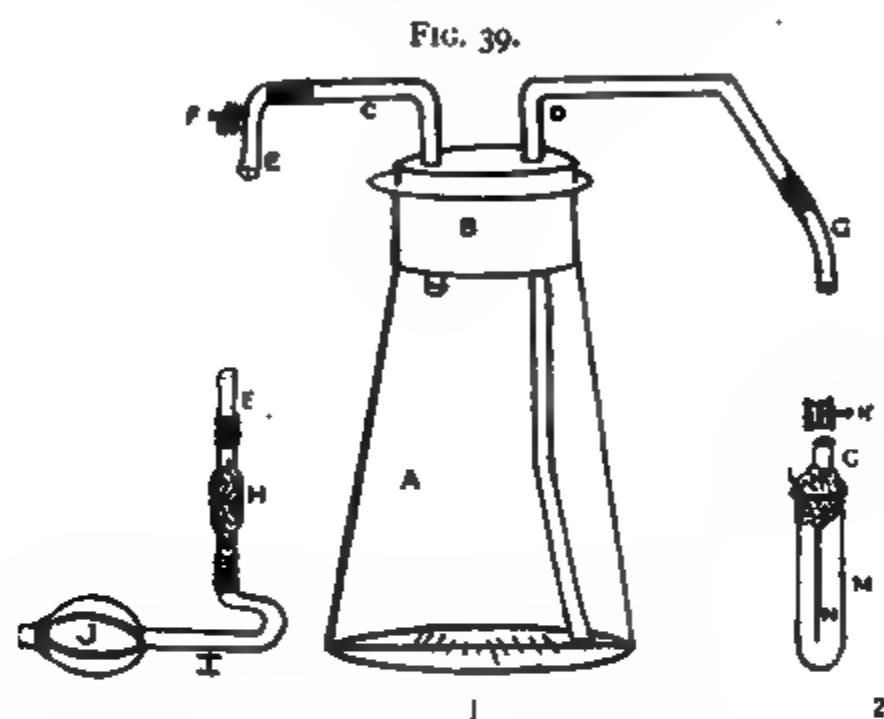
Liquor Senegæ Conc., which is officially made by maceration and expression like the corresponding preparation of calumba and of comp. sarsaparilla, this is advantageously made by the same process of percolation directed for all the other B. P. liquores concentrati. The percolate is perfectly bright at first, but owing to its natural acidity, a deposit forms on standing. If the bright portion is decanted, the remainder dissolved by ammonia, added to the clear portion, and the first reaction of the mixture adjusted so that it shall be *faintly but distinctly acid*, the resultant liquor keeps well and furnishes a satisfactory preparation.

Liquor Gentianæ Compositus Conc. is the subject of comprehensive experiments by E. H. Farr and R. Wright, with the object of producing a preparation that will, on dilution, produce a clear preparation fairly representing the official (B. P.) infusion. From these experiments, which should be consulted in the original, it appears that the disturbing element is the lemon peel, and that if this is substituted by the official tincture of lemon, the amount of alcohol slightly increased, the resultant concentrated infusion (1 : 7) is quite satisfactory.—Trans. Brit. Pharm. Conf., 1901, 422-436.

Gelatin Solution for Injections—Sterilisation.—C. Stich recommends for the sterilization of gelatin solutions for injections, that the air be first expelled by passing a current of carbon dioxide through the solution at a temperature of 36°-38° C., then adding ½ per cent. of carbolic acid, draw-

interval of 24 hours. Prolonged heat is liable to destroy or diminish the property of the gelatin to coagulate. The addition of carbolic acid in the quantity given does not interfere with its subsequent use. The sterilized vials are preserved in tin vessels, the cover of which is lined in the interior with flannel cloth saturated with 5 per cent. carbolic acid solution.—*Pharm. Ztg.*, May 21, 1902, 399.

Gelatin Solution—Preparation and Apparatus for Injections.—Hermann C. T. Gardner, referring to the recent unhappy results following the administration of injections of gelatin, makes some practical suggestions concerning the preparation and administration of gelatin solutions. Gelatin being a good medicine for the culture of micro-organisms, it is paramountly necessary to have a freshly prepared and sterilized solution for intra-venous injections. The gelatin is not dissolved in plain water, but in a 0.7 per cent. solution of sodium chloride, in order to raise the sp.

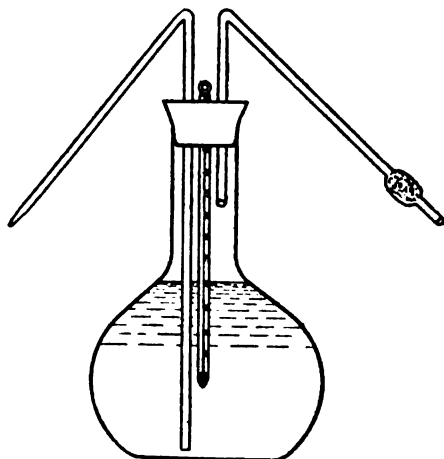


Injecting Apparatus.

gr. of the solution to that of the blood. A quantity of from 100 Cc. to 250 Cc. is generally employed, the strength of gelatin being 1 or 2 per cent. Perfect sterility cannot be ensured, but means can be taken to minimize the risk of contamination, the following method of preparing the the apparatus and injection having been employed at the London Hospital since the introduction of the remedy, about two years ago, without any unpleasant results: The details of the apparatus are indicated by letters in the accompanying illustration (Fig. 39). The red rubber tubing used is the best quality, and very thick walled, viz., $\frac{1}{4}$ inch in diameter, the bore being slightly less than $\frac{1}{8}$ inch. The whole of the apparatus, except the needle and pump, with its connecting-tube clamped, must be washed

before the solution is made. A large porcelain bowl, perfectly clean, is placed under a running stream of boiling water, the flask and glass tubes with the rubber tube (*G*) are rinsed well with formalin and then placed in the bowl together with the funnel to be used for filling and the test-tube (*M*), and are not removed until required for use. The flask in which the gelatin is to be dissolved should also be heated in the same way, and before handling any of these cleaned objects the hands should be scrubbed with an antiseptic soap and rinsed in a 1-in-20 solution of phenol. The chief difficulty occurs in the filtration of the solution, the two bugbears being the filter paper and the necessary exposure to air. The first is dealt with by treating the filter paper before use; the second cannot be entirely obviated, but is minimized by reboiling the solution after filtration in a flask, the neck of which is lightly plugged with cotton wool, and decanting after boiling as speedily as possible into the flask (*A*) of the apparatus, then quickly inserting the caoutchouc stopper (*B*) with its appurtenances and tying it to the rim of the flask—the clamps (*F*) and (*K*) on the rubber tubes (*E*) and (*C*) being firmly closed. The continuation of (*E*) is shown in the separate drawing, and consists of a glass bulb (*H*) filled with

FIG. 40.



Sterilizing Container.

sterile cotton wool, the rubber tube (*I*), and the ball-pump (*J*), while the separate drawing under (*G*) shows the intervening clamp (*K*), the test-tube (*M*), containing the needle (*N*), protected by cotton wool (*L*) in the mouth of the tube. The needle should be well cleaned inside before inserting it into the tube, by passing a wire rapidly through it under absolute alcohol, and it is sterilized after it has been fixed into the rubber

as shown in the drawing, sterilization being effected by carefully passing the tube several times through the flame of a Bunsen burner—taking care to stop before the color of the needle changes. The needle must on no account be removed from the test-tube until it is removed for use.—Chem. & Drugg., Sept. 7, 1901, 442.

Physiological Salt Solution—Convenient Sterilising Container.—The simple apparatus shown by Fig. 40 has been employed with advantage in the German Hospital, London, for sterilizing and administering physiological salt solution (0.7 per cent.). Its construction requires very little description. The bent tubes and thermometer are held in place by a caoutchouc stopper, the exit tube being pointed at the end, while the tube for the admission of compressed air is blown out near the outer end to a bulb, which is filled with cotton for filtering the air blown into the apparatus. The sterilization is effected by immersing the filled apparatus in boiling water and maintaining a temperature of 100° C. for at least one hour. It may then be delivered to the physician, and its sterility assured until the last drop has been inserted.—Pharm. Ztg., Nov. 23, 1901, 936.

Laboratory Solutions—Carbon Bisulphide a Preservative.—F. M. Alcock reviews some of the expedients that have been resorted to and recommended for the preservation of certain laboratory solutions, such as Fehling's, tartaric acid, sodium acetate, sodium hyposulphite, etc. He has tried carbon bisulphide as a preservative and finds that its use answers admirably in many of them, and so the following in which its presence does not appear to be objectionable: Solution of sodium acetate, tartaric acid, tartar emetic, and sodium hyposulphite.—Pharm. Journ., Dec. 28, 1901, 717.

Pepsin Solution—Use in Surgical Practice.—M. I. Wilbert calls attention to the use of digestive ferments in suitable form as local applications to dissolve the coagula and putrescent matter found in lesions, or the products of morbid changes in the living organism. The practice is not new, but has been heretofore confined largely to the vegetable ferment derived from a South American species of papaw, preparations of which have been used quite extensively to dissolve the false membrane in cases of diphtheria. Preparations of this ferment have also been used to some extent for external application, to aid in cleaning out disagreeable sloughing ulcers, etc., but the high price, the variations in the products found in the market, and the absence of a satisfactory way of making fluid preparations of this otherwise valuable ferment, restrict the field of its usefulness, and are drawbacks to its general adoption in surgical practice. The animal ferments have been so improved, however, during the past twenty years, that it has become quite feasible to substitute a properly prepared solution

of pepsin for the purposes named, and the author gives the formula for such a solution, which, under the name of

Physol (a name derived from the first syllable of the word "Physiological Solvent") has been used for some time with advantage in the out-patient department of the German Hospital in Philadelphia. The formula is as follows: Pepsin (U. S. P.), 50.0 Gm.; menthol, 0.5 Gm.; eucalyptol, 0.5 Gm.; oil of wintergreen, 0.5 Gm.; alcohol, 100.0 Gm.; glycerin, 50.0 Gm.; diluted hydrochloric acid, 20.0 Gm.; talc, 10.0 Gm.; distilled water enough to make 1000.0 Cc. The pepsin is dissolved in 800 Cc. of the water, the acid and glycerin are added, then a portion of the oils and menthol in the alcohol. Water is then added to make 1000 Cc., the talcum is added last and, after thorough shaking, the solution is filtered clear through paper. The product is a clear, light-colored and pleasantly aromatic fluid, appears to keep well without any change in its peptomizing properties, and, when mixed with two or three times its volume of water, and applied as a wet dressing, has given excellent results by removing the broken-down granulations and other foreign materials from old chronic ulcers and abscesses, leaving a healthy, granulating surface that may be treated as a clean wound in the regular manner. *Amer. Journ. Pharm.*, Nov., 1901, 535-538.

Essence of Pepsin—Formula.—H. C. Bradford gives the following formula for preparing an essence of pepsin:

Scale pepsin	128
Dilute hydrochloric acid.....	60
Glycerin	4
Best sherry wine	4
Distilled water, enough to make	16

Mix the glycerin, water, and acid; dissolve the pepsin in the water and add the wine and some talcum (about $\frac{1}{2}$ ounce). Let stand for several weeks, with frequent shaking, and filter. This pepsin solution will curdle milk (that property being imparted by rennet), but it is an elegant preparation and contains 1 grain of pepsin in each fluid ounce. —*West. Drugg.*, Feb., 1902, 59.

Liquor Ferri Albuminati Drees—Formula.—E. Nadler communicates the following formula for preparing Drees' solution of albuminate of iron. Prepare the precipitate of albuminate of iron in the usual way. Dissolve 100 Gm. of good soluble dry egg albumin and 100 Gm. of liq. ferri oxidi (Pharm. Germ.). Dissolve this precipitate in 200 Gm. of fresh distilled water. Transfer to a suitable flask and bring to the weight of 500 Gm. Add to this solution a previously prepared mixture of 100 Gm. of alcohol of sp. gr. 0.830 to 0.834 and 280 Gm. of distilled water, and, finally, a mixture composed of 3 drops of oil of cinnamon, 3 drops of eugenol, 1 drop of oil of calamus, 1 drop of anethol, 1 drop

eucalyptus, and 2 Gm. of aromatic tincture (Ph. Germ.). This liquor will keep well during several months. It, however, becomes more permanent (will keep longer) if a small quantity (1.5 Gm.) of liq. natr. caust. (Pharm. Germ.) is added. It is important that the precipitated ferric albuminate be dissolved within 10 to 12 hours after its precipitation.—Pharm. Ztg., Sept. 21, 1901, 759.

Solution of Bismuth Citrate—Improved Formula and Process.—Wm. Duncan reviews the literature of bismuth citrate and its solutions and arrives at the conclusion that the ammonium nitrate that is introduced into the solution if the bismuth citrate is not washed is in no way deleterious and may with advantage be neglected. On this ground, and particularly because of the great convenience, he proposes the following process for the preparation of solution of bismuth citrate :

Bismuth subnitrate.....	628.75 gr.
Citric acid.....	571.68 gr.
Ammonia solution	a sufficiency.
Distilled water to.....	20 fl. oz.

Mix the bismuth subnitrate and citric acid in a mortar with 1½ ozs. of water ; set aside, occasionally stirring for two hours, or until a little of the mixture yields with ammonia a clear solution. Then add a sufficient quantity of ammonia solution to dissolve, dilute with distilled water to 20 ounces, and filter.

This gives a liquor containing ammonium bismuthylcitrate equivalent to 3 Gr. of the oxide— Bi_2O_3 —or 5 Gr. of the citrate— $\text{BiC}_6\text{H}_5\text{O}_7$ —and 1 Gr. ammonium citrate in each fluid drachm, the latter improving the stability of the preparation. The preparation also contains about 1 gr. of ammonium nitrate in a drachm, the presence of which has no deleterious effect on the liquor medicinally or chemically.—Chem. and Drugg., May 31, 1902, 852.

Solution of Magnesium Citrate U. S. P. 1890—Improved Manipulation.—E. Claassen suggests that solution of magnesium citrate be prepared as follows : Put 31 Gm. of citric acid into a graduated vessel, add water to the 240 Cc. mark and dissolve in it 15 Gm. of magnesium carbonate. To the solvent add 95 Gm. of (granulated) sugar, filter as soon as dissolved, through a suitable, many-folded and moistened filter or through some cotton, follow with water enough to nearly fill the bottle of a capacity of about 360 Cc. Finally add 1 Cc. of spirit of lemon and then 2.5 Gm. of potassium bicarbonate, immediately close the bottle with a cork and secure it with twine.—Pharm. Rev., Aug., 1901, 351.

Solution of Magnesium Citrate—Preservation by Sterilization.—H. L. Sayre has employed sterilization with great satisfaction for preserving solution of magnesium citrate, his “modus operandi” being as follows :

Citric acid 12 grs.
 Water, enough to make..... 120 fl. oz.

Heat gently until solution results, strain the solution through cotton and measure into 12-ounce bottles, 10 ounces in each. Add to each bottle 2 ounces of syrup of citric acid (U. S. P.) and shake. Then insert tightly into the neck of each bottle a good-sized piece of absorbent cotton. Place the bottles in a vessel with a cover, if you have one; if not, cover them with several thicknesses of newspaper or heavy paper of some sort. Fill the vessel with water three-fourths of the way to the top of the bottles and bring to a boil, and continue the heat for one-half hour. Then the bottles may be removed and placed upon a shelf until wanted. When a bottle is to be dispensed, remove the cotton, add 40 grains of potassium bicarbonate, cork and label.—West. Drugg., Jan., 1902, 10.

Liquor Ammonii Anisatus—Formula.—G. W. Parisen, in response to a query requesting a formula for liquor ammonii anisatus, observes that in his locality both the formula of the Danish and the German Pharmacopœias are in use, the dispenser being guided by the nationality of the customer. The difference between these two formulas is very slight, and consists essentially in the somewhat greater ammoniacal strength of the Danish preparation. G. E. Thum, writing on the same subject, recommends the following formula for introduction into the U. S. P.: Oil of anise, three (3) parts; aqua ammonia, U. S. P., fifteen (15) parts; alcohol, sufficient to make one hundred (100) parts. These proportions are very similar to those of the Ph. Germ.—Proc. N. J. Pharm. Assoc., 1901, 66 and 68.

Solution of Lead Subacetate, U. S. P., 1890—Improved Manipulation.—E. Claassen suggests that solution of lead subacetate be prepared as follows: Mix in a mortar 170 Gm. of lead acetate and 100 Gm. of lead oxide, drop them into a jug of not less than 1000 Cc., or rather of a little more, and add 730 Gm. of hot distilled water, taking care to often shake the vessel, kept in a warm place, during the next half hour. Although the subacetate is now ready for use, it may be recommended to allow the jug to stand over night, so that the undissolved particles may settle. Finally filter the liquid in a closely covered funnel.—Pharm. Rev., Aug., 1901, 351.

Fluid Hydrastis—Formula.—H. C. Bradford gives the following formula for preparing a "fluid hydrastis:"

Hydrastine hydrochloride.....	20 grs.
Glycerin	6 ozs.
Distilled water	10 ozs.

Mix and filter. It is advisable to keep this preparation in amber bottles.—West. Drugg., Feb., 1902, 59.

LOTIONES.

Astringent Wash—Formula.—B. S. Cooban recommends the following formula for an "astringent wash," which has proven useful to correct coarse pores, and to remedy an oily or flabby skin, by applying it with a sponge night and morning: Cucumber juice (see under "Succi") 1½ ozs.; tincture of benzoin, ½ oz.; cologne, 1 oz.; elder flower water, 5 ozs. Put the tincture of benzoin in an eight ounce bottle, add the other ingredients previously mixed, and shake slightly. Strain through cheese cloth to remove any separated benzoin.—Bull. Pharm., April, 1902, 159.

Lilac Glycerin Lotion—Original Formula.—A writer in Amer. Drugg. (Dec. 23, 1901, 377) recommends the following formula for a glycerin lotion, which has received "honorable mention:"

Glycerin.....	8	ozs.
Water.....	8	ozs.
Sodium borate	2½	drachms.
Extract purple lilac, sufficient to perfume.		

Mix. Color a light violet tint; put up in 2 ounce Blakes; label.

Chapped Hand Lotion—Successful Formula.—George W. Hague publishes the following formula for a chapped hand lotion, which has met with great success:

Glycerin.	
Soap liniment, of each	2 ozs.
Tincture of arnica	1 oz.
Water	3½ ozs.
Oil rose geranium	20 drops.
Alcohol, sufficient to make	15 ozs.

—Amer. Drugg., Dec. 23, 1901, 377.

MISTURÆ.

Bismuth Salicylate Mixtures—Precautions when Made with Tragacanth.
—W. Lyon finds that when bismuth salicylate is prescribed in mixtures its suspension by the aid of mucilage of tragacanth sometimes leads to awkward results. Unless a smaller quantity of tragacanth is used than would be necessary if it were bismuth carbonate, the mixture soon becomes semi solid, and, even after thorough shaking, unpourable from the bottle. The author has made numerous experiments, which he describes in some detail, from which he concludes that the difficulty can be overcome by employing either of the two formulas and proportions, as follows:

1. Bismuth salicylate, 1 dr.; powdered tragacanth, 6 gr.; glycerin, ½ oz.; alcohol, 3 dr.; water, enough to make 3 oz.
2. Bismuth salicylate, 1 dr.; powdered tragacanth, 4 gr.; glycerin, ½ oz.; tincture (containing 60 per cent. alcohol), 1 dr.; spirit of chloroform, 2 drs.; water, enough to make 3 ozs.—Pharm. Journ., April 5, 1902, 274.

with paraldehyde, as follows: 1 Gm. of trional and 2 Gm. of paraldehyde are shaken together; 15 Gm. of almond oil added, and the mixture is heated in a closed flask to about 60° C., in a water-bath until solution is effected. The oily solution so obtained is dispensed in the form of mixtures.—Pharm. Centralh., Nov. 21, 1901, 724.

MUCILAGINES.

Mucilago Tragacanthæ, B. P., 1898—Value of Chloroform Water as a Preservative.—W. Lyon mentions that the official mucilage of tragacanth is so prone to become rancid, that the suggestion to employ chloroform water instead of distilled water has been generally well received. Parallel experiments made by the author with the officially prepared mucilage, and that prepared with chloroform water, confirm the stability of the latter preparation. The objection is the odor of chloroform.—Pharm. Journ., Nov. 30, 1901, 600.

OLEA.

Effervescent Oils—Properties and Advantages.—K. Dieterich gives some additional information concerning the properties and advantages of oils and fats super-saturated with carbon dioxide and introduced by him under the name of "effervescent oils" several years ago (see Proceedings, 1900, 494). Investigations made since by Dr. Dieterich with the assistance of Dr. Beddies have determined that under the influence of carbon dioxide easily splittable compounds of that acid with the fatty acids are produced which, particularly in the case of cod-liver oil, permit the more complete absorption of the oil than is the case with oil not treated with carbon dioxide. The carbon dioxide, moreover, acts as a preservative of the oils and renders them far more palatable, destroying the unpleasant taste of cod-liver oil, and to a certain extent also that of added medicaments very materially. The absorbability of carbon dioxide is, however, not the same in all oils. Cod-liver oil is capable of absorbing the largest quantity, castor oil the smallest, while olive oil stands intermediate.—Pharm. Centralh., Aug. 8, 1901, 485; from Helf. Annal, 1901.

Effervescent Castor Oil—Preparation.—K. Dieterich has introduced effervescent castor oil, prepared after the method described by him for preparing effervescent cod liver oil (see Proceedings, 1900, 494). In order to facilitate the introduction of sufficient carbon dioxide, however, to mask the taste of the oil, he finds it necessary to add a certain proportion of sweet almond oil and alcohol, the proportions being as follows: Castor oil, 75; sweet almond oil, 20; alcohol 5. The effectiveness of this preparation is equivalent to that of a preparation containing 95 per cent. of castor oil. The carbon dioxide is so combined that it does not escape on withdrawing the cork, but on shaking the bottle and pouring it out, it

forms an effervescent liquid which is quite palatable and easily administered even to children.—Pharm. Ztg., Feb. 26, 1902, 157.

Antiseptic Castor Oil—Formulas and Uses.—F. Blowski recommends antiseptic castor oil in place of the ordinary oil when it is desirable to produce evacuation of infected intestines. He uses for this purpose resorcin, 2.0, benzo-naphthol, 2.0, castor oil, 26.0 parts, the first disinfecting the contents of the stomach, the second the contents of the bowels. Another proportion is just one-half the strength. The antiseptic oil is given in the same doses as the ordinary.—Pharm. Centralh., Aug. 15, 1901, 496; from Wratsch., 1901, 611.

Ferrated and Iodo-ferrated Cod Liver Oil—Determination of Iron Content.—According to P. v. d. Wieden, the amount of iron in ferrated or iodo-ferrated cod liver oil may be accurately and conveniently determined as follows: 20 Gm. of the oil are mixed with 30 Cc. of petroleum ether, and shaken in a separatory funnel for at least 3 hours with 10 Cc. of 30 per cent. potassium hydrate solution and 20 Cc. of strong alcohol. The mixture is then shaken with 50 Cc. of conc. hydrochloric acid for one hour, 50 Cc. of water are added, to dissolve the potassium chloride formed, and the mixture allowed to stand until it has separated into two layers. The aqueous layer is withdrawn, and the oily layer washed three times successively with 20 Cc. of water and 5 Cc. of diluted hydrochloric acid, or until the washings fail to give a reaction for iron. The united aqueous liquids are heated to drive off alcohol and petroleum ether, allowed to cool, and filtered; 0.1 Gm. potassium chlorate is added, and after all the chlorine has been eliminated, this is followed by 10 Cc. of iodide and a few drops of starch solution, and the iron content determined by titration with $\frac{N}{10}$ sodium thiosulphate. Pharm. Ztg., May 7, 1902, 352; from Pharm. Weekbl., 1902, No. 16.

Sterilized Iodoform Oil—Preparation.—G. F. A. ten Bosch has observed that when water, iodoform and oil are shaken together in certain proportions and precautions, the iodoform and oil will combine and settle to the bottom. It is necessary to success that the oil shall not be present in excessive quantity, the most suitable proportion being 10 Gm. iodoform and 3 Gm. oil. The observation enabled him to prepare sterilized iodoform oil, for which he proposes the following formula: Into a brown flask of 120 Gm. capacity, place 10 Gm. of iodoform, add 60 Gm. of aqueous corrosive sublimate solution (1 : 1000) and shake the mixture occasionally. Then sterilize a quantity of oil (presumably olive or almond oil? Rep.), allow to cool, add 3 Gm. of it to the contents of the flask and shake until the iodoform and oil have combined and settled to the bottom. The supernatant sublimate solution is then decanted, the residual iodoform oil is washed several times with sterilized distilled water, and the waste water is finally allowed to drain off completely. This can be accomplished by

completely drained, 85 Gm. of the sterilized oil are added and a 10 per cent. iodoform oil is then produced on simple agitation to secure uniform admixture.—Pharm. Centralh., Dec. 12, 1901, 788; from Pharm. Weekblad, 1901, No. 37.

Camphorated Oil—Detection of Oils Substituted for Olive Oil.—J. F. Liverseege finds that the substitution of other oils for olive oil in the preparation of camphorated oil may, with the exception of arachis oil, readily be detected by the refractometer. In cases where the high iodine-absorption of the oil and high melting-point of the fatty acids indicate arachis oil, an attempt should be made to separate arachic acid, for which the author proposes the somewhat tedious method of Renard.—Chem. and Drugg., Aug. 31, 1901, 390.

Phosphorus Oil—Approximate Estimation of Phosphorus.—Gerlinger recommends a method for the estimation of phosphorus in phosphorated oils, which he considers sufficiently accurate for the approximate determination of the phosphorus content. It depends upon the fact that a solution of phosphorus, which under ordinary conditions evidences no phosphorescence in the dark, becomes suddenly luminous when heated to a certain degree, the temperature at which luminosity is developed being higher in proportion to the diminution of the phosphorus content.—Pharm. Ztg., May 3, 1902, 346; from Centralbl. f. inn. Med., 1902, No. 14.

OLEATA.

Oleate of Mercury—Method of Preservation.—F. W. E. Stedem finds that the addition of a little petroleum jelly to oleate of mercury acts as a perfect preservative, and recommends it for the replacement of 25 per cent. oleic acid. Make the oleate as directed, using but 25 per cent. of oleic acid, and after the solution is complete add without heat 25 per cent. of white petroleum jelly. It is believed that this small proportion of white petroleum does not retard the absorption of the oleate of mercury, and it unquestionably prevents the decomposition to the black metallic oxide which so often results after the official oleate of mercury is allowed to stand for a few months.—Proc. Pa. Pharm. Assoc., 1901, 195.

PILULE.

Sugar-Coated Pills—Advantages when Properly Made.—Two papers directing attention to the advantages of sugar-coated pills over other forms have been contributed to the January, 1902, number of the "Amer. Journ. Pharm." (pp. 32-34), the one by Wm. R. Warner, Jr., the other by Thomas S. Wiegand. Mr. Warner, after a brief historical review of the manufacture of these pills in America, makes the claim that properly manufactured sugar-coated pills, honestly made, possess decided advan-

tages over the ordinary pill of the shops, extemporaneously prepared. There is a more accurate subdivision of the medicament employed ; rapid disintegration after administration ; judicious selection of excipients ; and secure protection of the medicament by a readily soluble coating for a practically unlimited period. Mr. Wiegand, who was one of the earliest pharmacists to engage in the manufacture of sugar-coated pills, speaks in a similar vein. The disrepute into which sugar-coated pills have at times fallen, is due to carelessness in manufacture, the employment of heat, and dishonest methods. His remarks on the technics involved in the manufacture of this form of pills are quite interesting. He says, "every well-informed and experienced pharmacist knows that the compounding of pill-masses requires much care and judgment in the methods of manipulation and the selection of excipients which will make the 'mass' a good one to work and still remain in good condition when long kept—these two points being accepted as indisputable, the coating of the pill must be done with such materials as will not be insoluble in the juices and acids of the stomach. The materials employed are gum arabic, starch, small quantities of wheat flour, and sugar in form of syrup. A quantity of pills are placed in a 'pan' which rotates in a very peculiar way quite different from the confectioner's steam-coating pan, and a small quantity of syrup about half the density of simple syrup is poured on them ; the whole mass of pills rolling in the pan soon becomes moistened, and while moist a quantity of gum arabic is thrown in and a light coating of gum is thus given them, all unnecessary gum is removed and the sugar coating begins with an amount of syrup which is mixed with a little flour and enough finely powdered starch to render it opaque. The pills soon become sticky and form into a mass which must be stirred rapidly by the operator to set them free, and then they begin to roll around in the pan each as an independent body ; they must then roll until quite dry, when the process is repeated, each successive coat rendering the pill whiter and rounder. When they are well covered then plainer syrup, that is, one containing less starch, is used, and as they become smoother plain syrup is used ; after a time thinner syrup is used, and finally less and less will be required to moisten them. So fine a surface is at last imparted that 100,000 pills will become moist with the addition of two or three tablespoonfuls of syrup. This is practically all that can be written about the subject. The success of making a fine-looking lot of sugar-coated pills is to be learned only by working at the pan until you can do it." It must be emphasized that the process of coating is conducted throughout without heat—the drying of each coating being accomplished by driving a current of cold air into the pan while the pills are being covered with sugar—and that this method originated with Mr. Wiegand.

Pills of the B. P.—Use of Glucose Syrup as an Excipient, etc.—W. Lyon observes that the use of glucose syrup as an excipient for making

in which it is directed, except that in the case of lead and opium pills a somewhat larger quantity should be used, while the compound pill of soap becomes softer than is advisable with the official quantity. The exceptions in which syrup of glucose is not completely successful are pill of aloes and myrrh and compound pill of galbanum. In the *pill of aloes and myrrh* the mass lacks adhesiveness, but the addition of one per cent. of powdered tragacanth gives it the necessary plasticity. The *compound pill of galbanum* must, however, be regarded a failure, in twenty-four hours' time the pills become quite flat. This flattening is not to be attributed to the glucose, but appears to be due to the medicinal ingredients themselves, for it occurs without the use of glucose. By substituting an equal weight of ammonium carbonate for the glucose syrup, the ingredients could be readily beaten into a satisfactory mass, but the pills also flattened out on standing, just as they had done in all experiments tried. The author is of the opinion that the ingredients, instead of being formed into pills, had best be made into compressed tablets—a mass being readily formed for this purpose by beating them together in a warm mortar. Owing to the resinous nature of the compound pills of colocynth mass, it is a difficult matter to mix it with a soft extract like hyoscyamus in making the

Pilulae Colocynthis et Hyoscyami.—Unless the colocynth pill mass is pretty firm, the addition of the extract makes the pill much too soft. It is a good practice, and one that generally prevails among pharmacists, to use the ingredients for the colocynth pill mass in form of powder, add the extract of hyoscyamus, and then the calculated quantity of water to make a firm mass.—Pharm. Jour., Oct. 5, 1901, 408-409.

Pills—Uniform Rule Governing Small Sizes.—John H. Haydon, Jr., suggests that a rule should be established for the prescription department to govern the size of *small* pills, so that different clerks would turn out uniform work. He suggests one-half grain as the most appropriate size, and either powdered licorice or starch, according to the color of the active component, as a diluent.—Amer. Drugg., Sept. 23, 1901, 169.

Compound Cathartic Pills—A Good Liver Pill for Counter Dispensing.—B. S. Cooban observes that on the list of spring specialties, suitable for counter dispensing, he knows of none better than a good liver pill as represented by the U. S. P. compound cathartic pill. This can be supplied either in pills or chocolate-coated tablets.—Bull. Pharm., Jan., 1902, 14.

Creosote Pills—Preparation.—John J. Bryant finds that creosote pills containing 1 minim in 4 parts of the mass, can be made temporarily as follows, the pills remaining pliable and readily softening with the warmth of the fingers:

Creosote.....	4 parts.
Powdered animal soap	2 parts.
Mix thoroughly in a warm mortar and add—	

Yellow beeswax (previously melted)	4 parts.
Mix thoroughly and incorporate in the mixing-machine with—	
Powdered licorice.....	1 part.
Powdered althæa.....	1 part.
Calcium phosphate.....	2 parts.
Kaolin	2 parts.

The mixing should be done lightly and not carried on for longer than necessary to make a uniform mass.—Chem. and Drugg., Feb. 2, 1902, 199.

Pills of Black Oxide of Copper—An Efficient Tape-worm Remedy.—The efficiency of black oxide of copper as a tape-worm remedy has been pointed out by Rademacher many years ago. In view of the prohibition (in Germany) to dispense oleoresin of male fern without prescription on account of the possible untoward results, Dr. Dörr again calls attention to the copper oxide, which he regards not alone perfectly free from toxicity, provided that acid food and drink is avoided, but also that it is certain in its effects. He prescribes it in the form of pills, prepared as follows: Cuprum oxydum nigrum, 6 Gm.; calcium carbonicum, 2 Gm.; bolus alba laevigata, 12 Gm.; glycerinum, 9.0 (about 10) Gm.; m. f. pil. 120. The quantity to be prescribed for adults, 2 pills to be taken four times daily, followed several days after the last dose by castor oil. For children from 50 to 60 pills are sufficient for a treatment, two pills being given only twice a day, and followed by castor oil as in the case of adults.—Pharm. Centralh., Nov. 21, 1891, 734; from Therap. d. Gegenw., 1901, 528.

Pilula Ferri, B. P., 1898—Expeditious Method of Preparation.—W. Lyon finds the formula for pilula ferri, B. P., to be open to criticism only on one point, namely, that initially the mass is so soft that it has to be set aside for half an hour before it is firm enough to be rolled out. The pills can be prepared expeditiously, however, if the 150 grains of syrup directed in the official formula are replaced by 150 grains of powdered sugar and 40 grains of water are used instead of the 20 grains directed. This practically amounts to a reduction of 30 grains of water—the syrup containing 50 grains—and enables the formation of a mass which can at once be rolled out, divided, and formed into pills.—Pharm. Jour., Nov. 30, 1901, 600.

Pills of Thyroid Gland—Preparation.—Paul Antoine recommends pills of thyroid gland as being the most convenient method of administration, the active ingredient retaining in this form its full power indefinitely. After carefully selecting healthy glands, they are carefully minced or pulped, and the paste thus obtained spread out in a thin even layer, and dried *in vacuo* over H_2SO_4 . Eight to ten hours' drying will be long enough to obtain the thyroid substance in the form of perfectly dry detachable scales. 5 Gm. of these are equivalent to 20 Gm. of the fresh

powdered tragacanth, 2 Gm., powdered wood charcoal, 4 Gm., massed with simple syrup and divided into 100 pills, which are dried, like the gland paste, *in vacuo*, over H_2SO_4 . When dry, they may be coated with tolu, mastic and benzoïn, gluten, or any desired coating.—Pharm. Jour., July 21, 1901, 62; from L'Union Pharm., 42, 241.

PULVERES.

Powder Folding—An Old Device for Regulating Size.—Joseph F. Hosteley calls attention to an old device for regulating the size when folding powders, which is shown by Figs. 41 and 42, and gives the following directions for constructing it cheaply: From a piece of tin or sheet brass cut a

FIG. 41.

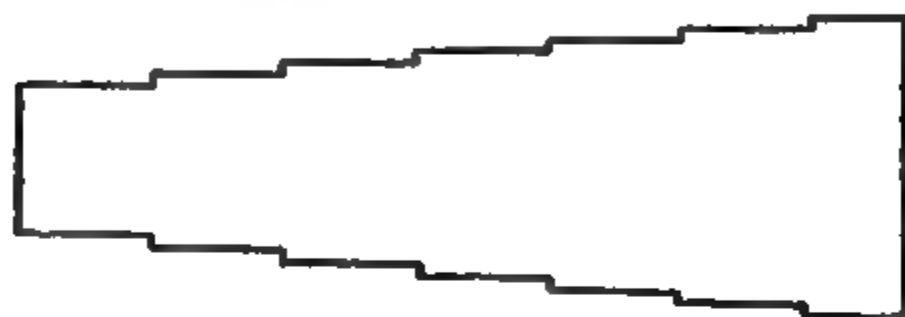
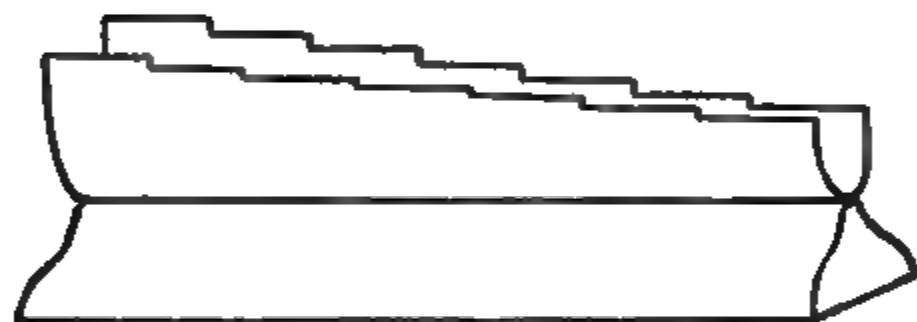


FIG. 42.



Powder Folder.

figure of the shape shown in Fig. 41. Bend this piece of metal lengthwise into the form of a trough, and secure it to a block of hard wood as shown in Fig. 42. To determine just the proper gradation to make in the scale, it will be well first to fashion a model from a section of cardboard.—Bull. Pharm., April, 1902, 152.

Seidlitz Powders—Commercial Examination of Quality.—Rolland H. French has made experiments in order to simplify the seemingly complicated and impracticable methods which have been proposed by previous investigators for ascertaining the commercial quality of Seidlitz powders. The important points to determine are the correct weights of the acid and

Seidlitz mixture, and the proportions of sodium bicarbonate and Rochelle salt in the latter—applying, of course, such quantitative tests for impurities as are given in the U. S. P. for the respective components. The author concludes that, for all commercial purposes, a Seidlitz powder analysis consists in making a CO_2 determination, calculating the sodium bicarbonate, and—providing the qualitative tests show no contaminating impurities—calculating the Rochelle salt by difference. The author's results with commercial samples, exhibited in table, show considerable variations in the total quantities, as well as carelessness in the preparation of the components.—*Amer. Journ. Pharm.*, Feb., 1902, 74–80.

Soluble Manganese Saccharate—Preparation by Means of Permanganate.—F. Gowillon recommends a process for preparing soluble manganese saccharate which is based upon the observation that when solution of permanganate is added in small quantities to sugar syrup, the manganic oxide at first formed by the reduction of the permanganate is converted into manganous oxide. This unites with the sugar to form a saccharate, whilst the small quantities of carbonic and oxalic acids, which are products of the decomposition, unite with the alkali liberated from the permanganate. To prevent the formation of manganese oxalate, it is advisable to operate at low temperatures, as follows: To 1000 Gm. of sugar contained in a flask, 300 Gm. of a 3 per cent. solution of potassium permanganate are added. The flask being closed, it is allowed to stand 3 or 4 days in the cold, when 300 Gm. more of 3 per cent. permanganate solution are added, the mixture shaken until solution is effected, and again allowed to stand as before. The resultant syrup is then ready for use, 100 Gm. containing 0.05 Gm. of manganous oxide. The formation of this soluble permanganate may, however, also be accomplished by a dry method. To this end, the before prescribed quantities of sugar and permanganate solution being used, the latter is added in small quantities at a time, and allowed to dry before adding the next portion. The process is ended in 15 to 30 days, the product being perfectly and clearly soluble in water.—*Pharm. Ztg.*, Feb. 1, 1902, 90; from *Rép. de Pharm.*, 1902, No. 1.

Headache Powders—Original Formula.—The following formula for headache powders is recommended in *Amer. Drugg.* (Dec. 23, 1901, 377):

Acetanilid	15	grains.
Sodium bicarbonate.....	15	grains.
Caffein	5	grains.
Codeine sulphate.....	1 $\frac{1}{4}$	grains.
Extract of guarana	2 $\frac{1}{2}$	grains.
Extract of rhubarb.....	2 $\frac{1}{2}$	grains.

Divide into 10 powders.

Salicylated Talcum—Original Formula.—The following formula is “honorably mentioned” in *Amer. Drugg.* (Dec. 23, 1901, 377):

Lycopodium	50 ozs.
Powdered starch	25 ozs.
Zinc oxide.....	10 ozs.
Extract of violet, sufficient to perfume.	

Mix. Put up in tall paper, sprinkler top boxes.

RESINAE.

Hydrastin—Characters and Formula of the B. P. C. F.—Thomas Maben expresses satisfaction that hydrastin, among other drugs of importance, has now been semi-officially recognized by its introduction as a preparation of the B. P. C. Formulary. He regards it to be an error, however, that the committee have adopted a process which does not yield a product such as pharmacists have been accustomed to dispense and physicians to prescribe—that certainly does not correspond to the better grades of the imported (into England) article. This process is as follows: “Hydrastis rhizome, No. 60 powder, 1 lb.; alcohol (60 per cent.), a sufficient quantity. Moisten the rhizome with 8 fluid ounces of the alcohol, pack in a percolator, gradually pour on more of the alcohol till the hydrastis is exhausted, collect the liquid and remove the alcohol by distillation; evaporate the residue to dryness and reduce to a fine powder.” The resultant preparation, as prepared by a reliable firm, has been subjected to assay, along with four samples of hydrastin of American origin and one from an unknown source. The results are shown in the following, No. 6 being the aforesaid B. P. C. F. product:

Sample No.	1	2	3	4	5	6—B. P. C. F.
Hydrastine ...	15.2 per cent.	8.7 per cent.	trace.	trace.	trace.	trace.
Berberine	23.56 “	9.67 “	26.9 per cent.	16.53 per cent.	“	“

The paper lacks information concerning the identity of the samples designated as Nos. 1, 2, 3, 4 and 5. He observes that three of the samples were of a bright yellow color, in fine powder, and perfectly non-hygroscopic; one was darker in color, but non-hygroscopic; the other two, including the B. P. C. F. sample, were in coarser powder, hygroscopic in character, and also darker in color. The author concludes that the preparation called “hydrastin” in the B. P. C. Formulary would more appropriately be designated “*Extractum hydrastis siccum*,” but that the extract should be standardized to contain 10 per cent. of white alkaloid (hydrastine) or 20 per cent. of total alkaloids, of which at least two-fifths should be hydrastine. If it be desired to include a “hydrastine concentration,” it would be sufficient to describe its characters, and to say that

it should contain double the alkaloids in the extract. The greater part of the author's voluminous paper is devoted to a description of the alkaloids, the percentage of their presence in the rhizome, and the methods of their quantitative determination. Most of this is not new to American readers, but as a matter of statistical record it may be mentioned that the average percentage of hydrastine, covering a range of from 1.6 per cent. to 2.92 per cent., and quoted from the laboratory records of drug assays, was 2.28 per cent. The range of berberine was from 2.22 per cent. to 4.15 per cent.—Trans. Brit. Pharm. Conf., 1901, 408–416.

SAPONES.

Soap—Inaccuracies in Pharmacopœial Tests and Definitions.—Prof. L. E. Sayre calls attention to the necessity of a more exact definition of what is meant by “soap in fine powder,” since it is possible to produce a powder with soap containing as much as 7 per cent. of water, while the commercial powdered castile soap contains only from 1.5 to 3.2 per cent. of water. Furthermore, the fact that a maximum limit of water (36 per cent.) is given in the Pharmacopœia and no minimum, under the official test for alkali open to inaccuracy, since the total free alkali in a more or less dry soap must necessarily be higher than that in the same sample of soap containing the maximum amount of water. Moreover, the pharmacopœial test itself is not satisfactory, since it does not give a sharp end reaction. If the soap solution (which is an aqueous solution) be titrated, according to the directions of the Pharmacopœia, with decinormal oxalic acid, the disappearance of the red color seems to be a gradual, sluggish bleaching, or fading out, rather than a sharp end reaction, and the red color seems to continue beyond the neutral point. This difficulty may be overcome by the use of alcohol instead of water as a solvent for the soap in the test. Even diluted alcohol is better than water as the solvent. If alcohol be employed, the point of neutrality is sharply marked and the accuracy of the result is all that could be desired.—Drugg. Circ., May, 1902, 92.

Alcoholic Pumice Soap—Preparation.—S. Pfortinger has given a formula for preparing a pumice soap which is recommended for the disinfection of the hands, etc. A good neutral soap prepared from vegetable fat is the most suitable. From 60 to 90 Gm. of such soap, finely scraped, are dissolved in 300 Cc. of 96 per cent. alcohol on a water-bath, and when solution is effected it is brought to the volume of 1000 Cc. with sufficient hot alcohol. Then 300 Gm. of finely-powdered, dried and sterilized pumice are added, and the mixture is shaken energetically in a flask until it cools and acquires a thick consistence. It may then be transferred to suitable vessels, capable of being well closed, in which it eventually congeals so as to form a creamy soap. It is important to so manipulate that the pumice shall not separate to the bottom, this being accomplished by continued

shaking until the soap is thick, but not too thick to pour from the flask in which it is made.—Phar. Ztg., Aug. 3, 1901, 619; from D. Mer. Wschr., 1901, No. 30.

Spiritus Saponatus, Ph. G.—Estimation of Free Alkali and Soap.—Otto Schmatolla regards the official test for estimating the quality of Spiritus saponatus, Ph. Germ., which is restricted to a determination of specific gravity, as insufficient, since it gives no criterion either as to quality or quantity of soap in the preparation. He therefore suggests the additional requirement or determining the total soap and the free alkali in it. For the latter purpose 10 Cc. of the preparation are heated with saturated solution of sodium chloride in excess two or three times, the precipitated soap being removed by straining through linen and pressing. The united salt solutions are filtered and the free alkali is then determined in the clear filtrate, using $\frac{N}{10}$ hydrochloric acid and methyl orange as indicator. Not more than at most 3 Cc. of the $\frac{N}{10}$ acid should be required for the purpose. The estimation of the soap is then also carried out alkalimetrically; To one Cc. of the spirit of soap, 1 or two drops of methyl orange (1:500) are added, and the liquid titrated, slowly towards the end, with $\frac{N}{10}$ hydrochloric acid until a permanent rose-red color is produced. This color secretion is very sharply defined in the milky-white fluid resulting on the addition of the acid. If the preparation contains the proper amount of soap, from 18.5 to 29 Cc. of the $\frac{N}{10}$ acid should be required. Moreover, the separated oleic acid affords a criterion of the quality of the soap employed.—Pharm. Ztg., Aug. 24, 1901, 674.

Surgical Soap Solution—Formula.—Terrier employs a liquid soap for general washing of patients, prepared as follows: White castile soap, 1 kilo; soft soap, 1 kilo; olive oil, 1 kilo; water, 50 liters; naphthol, 25 Gm.; oil of lemon, q. s. to perfume. The soaps, oil and water, are heated together for at least 24 hours, the naphthol (and oil of lemon) added, and the solution is filtered.—Pharm. Journ., Feb. 8, 1902, 102; from L'Univ. Pharm., 42, 533.

Liquid Antiseptic Soap—A Good and Economical Formula.—M. I. Wilbert recommends the following formula for a liquid antiseptic soap which has been found in the German Hospital, Philadelphia, to perfectly replace a more expensive commercial product that had previously been used with advantage in the operating room: Cotton-seed oil, 300; alcohol, 300; water, 325; sodium hydrate, 45; potassium carbonate, 10; ether, 15; carbolic acid, 25 parts. To the oil contained in a bottle, add 100 Cc. of water and 200 Cc. of alcohol; add the sodium hydrate and shake, or stir occasionally until saponification has taken place, then add the remaining portion of the alcohol, and the potassium carbonate dissolved in the water; lastly, add the carbolic acid and the ether and mix or shake well. Keep in well-corked vials, and if possible, at a temperature not below 10° or

12° C., so as to prevent solidification—though it readily reliquefies on exposure to gentle heat. It is light yellow, has a distinctly alkaline reaction, produces a copious lather, and possesses a not unpleasant ethereal odor. A good soap for the toilet may be produced by omitting the ether and carbolic acid and substituting a little essential oil, such as oil of rose-geranium or oil of bergamot.—Amer. Journ. Pharm., April, 1902, 172-175.

SPIRITUS.

Sweet Spirit of Nitre—Inquiry into Causes of Change.—E. H. Farr and R. Wright give the details of experiments made to determine some of the causes of loss in strength of sweet spirit of nitre. The results of this inquiry give conclusive evidence of the extreme rapidity with which the official (B. P.) preparation will part with the whole of its active constituent under ordinary conditions of storage. Furthermore, that diffused light, however bright, has no chemical action on the spirit, but that exposure to direct sunlight is fatal. The observation by Harvey that amber-colored glass affords perfect protection to the spirit in all circumstances is confirmed. In partially filled bottles there is a loss owing to diffusion.—Trans. Brit. Pharm. Conf., 1901, 447-452.

Spirit of Nitrous Ether, B. P.—Progressive Deterioration in Containers.—S. F. Burford has recorded the progressive deterioration of spirit of nitrous ether in containers from which it was dispensed, under the following conditions: 18 ozs. of a sample having a sp. gr. 0.844 at 60° F. was placed in a 30-oz. N.M. recess-labelled bottle, and kept on ordinary bottle-shelf, with the results as here noted:

Date.	Actual Amount of Sample in Bottle.	5 Cc. Sample = Cc. NO.	Loss.
April 1, 1896	18 ozs.	39.8	—
May 8, 1896.....	—	36.0	3.8
June 1, 1896.....	11 ozs.	30.8	5.2
July 1, 1896	10 ozs.	24.6	6.2
August 1, 1896.....	5 ozs.	19.0	5.6
September 10, 1896.....	14 dr.	13.1	5.9
October 1, 1896.....	7 dr.	6.8	6.3

It is interesting to note the proportional regularity of loss. Similar results were obtained in another instance, which is also recorded.

That the air space has much to do with the decomposition is clearly shown by the following experiment, in which 4 oz. white stoppered bottles were employed, and after receiving the samples were tied over with capping-leather and placed on the shelf freely exposed to light. The original sample = sp. gr. 0.839 at 60° F., April 19, 1898; 5 Cc. = 36.2 Cc. NO at 60° F. and 755 mm.; 10 grammes = 9.70 Cc. $\frac{N}{10}$ NaOH.

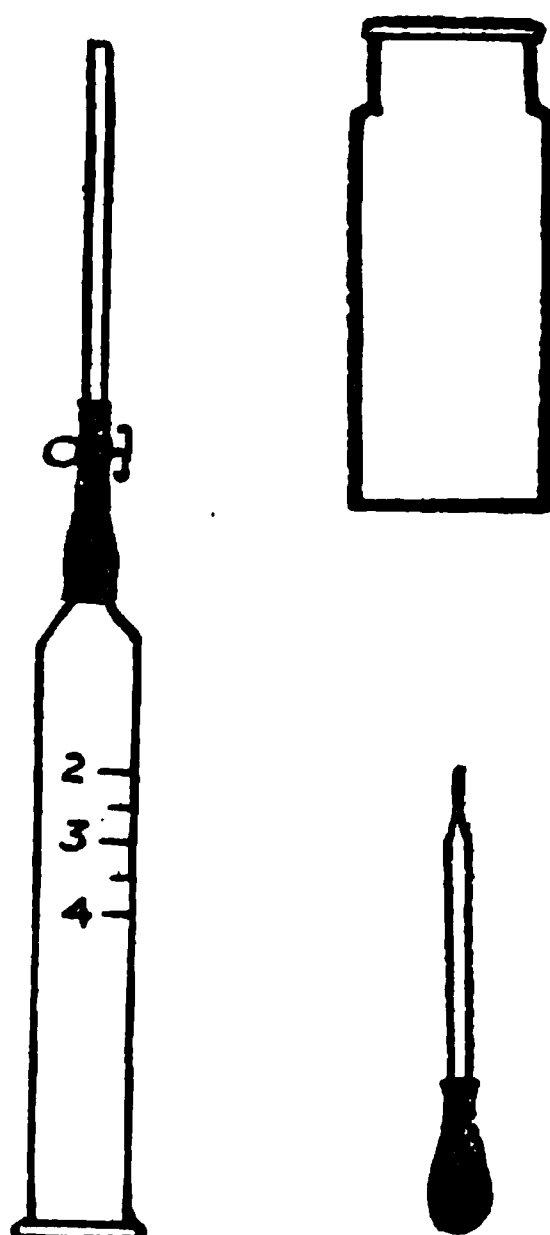
Bottles completely filled, then 2 dr. poured away, allowing air-space.	Bottles half-filled.
<p>Bottle A—Examined October 18, 1898: 5 Cc.=36.4 at 60° F. Same re-opened October 25, 1898: 5 Cc.=32.0 at 60° F. and 754 mm. 10 Gr.=10.20 $\frac{N}{10}$ NaOH. Bottle B—March 29, 1899: 5 Cc.=36.2 at 60° F. 10 Gr.=7.60 $\frac{N}{10}$ NaOH. Bottle C—April 25, 1899: 5 Cc.=36.2 at 60° F. 10 Gr.=6.27 $\frac{N}{10}$ NaOH.</p>	<p>October 25, 1898: 5 Cc.=28.2 Cc. NO at 60° F. 10 Gr.=13.06 $\frac{N}{10}$ NaOH. March 29, 1899: 5 Cc.=28.0. April 5, 1899: 10 Gr.=14.18 $\frac{N}{10}$ NaOH. April 25, 1899—Duplicate sample: 5 Cc.=14.4 Cc. 10 Gr.=18.57 $\frac{N}{10}$ NaOH. Possibly the great difference between these duplicate samples might be due to imperfect stoppering.</p>

—Chem. and Drugg., July 20, 1901, 108.

Spirit of Nitrous Ether—Construction of a Cheap and Simple Nitrometer.—J. A. Hughes describes a nitrometer suitable for estimating the percentage of ether in spirit of nitrous ether, the essential parts of which are a 1 ounce male glass syringe, a small section of rubber tubing, a pinch-cock, a small piece of glass tubing, a quinine bottle, and a medicine dropper. The piston having been removed from the syringe, the glass tube is attached to the nozzle by means of the section of rubber tubing, the latter being of such length that a small pinchcock may be attached between the two glass ends. The pinchcock being attached, the syringe is held upright, 2 drachms of water are poured into it, and a scratch is made with a file to indicate its exact height; then water is added, $\frac{1}{2}$ drachm at a time, up to a total of 4 drachms, each addition being noted with a file. A perforated cork (or the wood-topped cork through which the piston slides in the original instrument) is then inserted into the mouth of the syringe. This prevents the escape of gas and the admixture of the liquids within and without the syringe during the experiment, which is conducted as follows: Nearly fill the quinine bottle with strong solution of common salt, and place the nitrometer into it, wide end down, at the same time opening the pinchcock. Suck up the solution until it is just above the rubber joint, and promptly close the pinchcock. Now raise the nitrometer, and if the liquid inside remains up in sight above the rubber joint and does not sink, the pinchcock is air-tight and satisfactory; if not, make it so. Replace the filled nitrometer in the bottle. Next measure accurately 30 minims of the spirit to be tested, and with great care, and without any unnecessary exposure to the air, transfer, with the pipette, to the glass tube of the nitrometer; then, by pinching the pinch-cock, allow it to run into the nitrometer. It is very important that the

level of the liquid in the nitrometer be kept higher than that in bottle. Now swill all the spirit out of the measure with 20 minims of water and transfer to the nitrometer. Next add in the same way 30 minims of solution of potassium iodide (44 gr. to the ounce), and lastly, 30 minims of acid. sulph. dil. There is no need to swill the measure into the nitrometer in the case of the last two, but in each case be careful not to run the solution completely in—always leave the last drop in sight above the pinch-cock. This is to ensure that no air enters the nitrometer, and that no gas

FIG. 43.



escapes. Allow the apparatus to stand for a few minutes. Then raise the nitrometer until the liquid is the same level within and without, and read off the volume of gas. Half a drachm of the spirit of nitre ought to give from $2\frac{1}{2}$ to $3\frac{1}{2}$ drachms of gas—that is, from 5 to 7 vols.

The entire outfit is shown by Fig. 43.—Chem. and Drug., Dec. 28, 1901, 1045.

Spirit of Camphor—Method of Assay.—Schmatolla recommends the following simple method for the estimation of camphor in the spirit: Introduce 10 Cc. of spirit of camphor into a 50 Cc. burette graduated to 0.1 Cc., add 30 to 35 Cc. of a saturated solution of sodium chloride, and shake well, whereupon the camphor will separate completely from its alcoholic solution and rise to the surface. Now pour exactly 1 Cc. of petro-

the camphor by gentle rotation of the column or held in an upright position. The increase in volume of the benzin gives the quantity of camphor 1.02 Cc. corresponding to 1 Gm. of camphor assuming its sp. gr. to be 0.98. To avoid a too voluminous separation of the sodium chloride, its solution may be moderately warmed before its addition to the spirit, but the mixture must be perfectly cool before adding the benzin.—Pharm. Centralh., Aug. 1, 1901, 472; from Apoth. Ztg., 1901, 290.

Spiritus Russicus—Formulas.—O. Langkopf gives several formulas for preparing "spiritus russicus," which he regards to be preferable to the older formulas in common use:

I. Five parts of powdered mustard seeds and 10 parts of water are stirred together, and 2 parts each of capsicum, camphor and sodium chloride, 5 parts of ammonia water, and 80 parts of alcohol are added, the mixture being macerated 8 days. It is then filtered, and completed by the addition of 3 parts each of oil of turpentine and ether.

II. Capsicum, 1000; alcohol 10,000; oil of turpentine, ammonia water, spirit of camphor, of each 500; artificial oil of mustard, 25; ether, 750.

III. Mustard seed, capsicum, sodium chloride, camphor, of each 120; alcohol (90 per cent), 2000; oil of turpentine, ammonia water, of each 120.—Pharm. Ztg., Sept. 11, 1901, 730.

Flavoring Extracts—Practical Formulas and Observations.—Prof. Wilbur L. Scoville makes some practical observations on the preparation of flavoring extracts, which will be consulted with interest and profit in the original, from which the following may find place here. With regard to

Extract of Vanilla, he calls attention to the fact that to the average consumer quality is quite as much a matter of imagination as of fact, and the pharmacist is obliged to accommodate the quality of his supplies to the demand. Thus, one manufacturer, in order to supply the varying demands made upon him, has been obliged to keep on hand five different kinds—one each of best Mexican vanilla beans, one of short Bourbon beans, one of Tahiti beans, one of Vanilloes, or "wild vanilla," and one of Tonka beans. A suitable combination of any one or two of these with vanillin and coumarin could easily be made to meet any demand, and even vanillin and coumarin alone, with caramel to color, would settle the question in some cases. Coming then to the method of making the extract, there is one general agreement, namely, that a long maceration—two weeks to three months, or as much longer as possible—is an advantage. Other details vary very considerably. The strength of alcohol varies from two volumes of water to one of alcohol to the reverse, but the most common is diluted alcohol made with equal volumes. Modernly, extracts made from vanillin and coumarin are gaining in favor. There

has been much prejudice against the use of these synthetics because of the former use of

Artificial Extracts of Vanilla, of which the following may serve as a type :

Ext. tonka.....	6 pints.
Prunes.	1 pound.
Raisins	4 ounces.
Currants	3 ounces.
Peru balsam	3 ounces.
Powd. orris root.....	4 ounces.
Molasses	2 pints.
Diluted alcohol.....	to make 2¼ gallons.

The use of vanillin for preparing vanilla flavoring extracts is growing, however, and Prof. Scoville emphasizes that *so far as vanillin can represent the true vanilla flavor vanillin is fully equal to the finest bean*. But vanillin is found to be too delicate to compare well with the best natural vanilla ; a slight proportion of coumarin appears to be necessary to bring out its qualities, and this is admirably accomplished in the

Compound Tincture of Vanillin of the National Formulary. A very popular preparation also, one that represents a lower grade of extract, is a so-called "white vanilla," which is largely sold for domestic purposes, and is imitated closely by the following formula :

Vanillin	1/3 drachm.
Coumarin.....	15 grains.
Glycerin.	2½ ounces.
Alcohol.....	3 ounces.
Water	to make 1 pint.

This is decidedly inferior to a cultivated taste, but is undoubtedly more popular.

Lemon Extracts stand next to vanilla in popular demand for ordinary purposes. For a high-class extract the U. S. P. spirit of lemon leaves nothing to be desired, provided the oil of lemon employed is all right. Here the use of concentrated oil, terpeneless oils, etc., comes into use, together with the rind of the fresh fruit, as illustrated by the following formulas :

(1) Yellow peel of 15 lemons, grated.

Concentrated oil of lemon.....	2½ drachms.
Alcohol	4 pints.
Water.....	4 pints.

Macerate 24 hours and express. If necessary filter through magnesium carbonate.

(2) Yellow peel of 15 lemons.

Citral	2 drachms.
Oil of lemon	2 ounces.
Alcohol	4 pints.
Water.....	4 pints.

Treat as above.

(3) Concentrated oil of lemon.....	24 minims.
Citral	36 minims.
Oil of lemon	4 ounces.
Tinct. curcuma	4 ounces.
Alcohol	3 pints.
Water.....	5 pints.
Magnesium carbonate	2 ounces.

Shake together occasionally during 24 hours and filter, returning the first portions to the filter until the liquid comes through clear. .

Extract of orange corresponds in all respects to lemon extract, except that there is no substitute for citral to use for orange. The best extract of orange can be made by substituting orange peel and orange oil for lemon in the U. S. P. spirit of lemon, *i. e.*:

Fresh orange peel, outer portion only	50 Gm.
Oil of orange	50 Cc.
Alcohol, enough to make.....	1000 Cc.

Macerate 24 hours and filter.

The flavor will vary more than with lemon because of the greater variety of oranges to be had. Tangerine oranges, for instance, would impart their peculiar odor and flavor to the foregoing product. Most

Other Fruit Flavors are made from ethers; but none of these are very popular.

Almond Extract should be made from bitter almond oil free from hydrocyanic acid. While

Extract of Rose is always made from the oil of rose, and preferably colored with rose petals, the following being a good formula :

Oil of rose.....	1 drachm.
Oil of clove	6 minims.
Rose petals	2 ounces.
Alkanet	10 grains.
Alcohol	24 ounces.
Water, enough to make.....	2 pints.

—Bull. Pharm., April and May, 1902, 153-155 and 188-190.

SUCCI.

Vegetable Juices—Freezing Point.—Walter F. Sutherst has made some determinations of the freezing point of vegetable juices, which have an

important bearing on the estimation of the injurious effect of frost on certain vegetables and fruits. His results are as follows :

	Freezing-point. °C.
1. Vegetable marrow—(a) Leaf and stalk	—0.75
(b) Fruit	—0.75
2. Swede turnip—(a) Leaf and stalk	—1
(b) Bulb	—1
3. Celery—(a) Green stalk and leaf	—1.4
(b) White portion	—0.75
4. Carrot—(a) Leaf and stalk	—1.2
(b) Root	—1.0
5. Cabbage—(a) Outside leaf	—1.1
(b) Heart	—0.85
6. Apple	—1.4
7. Pear	—1.75

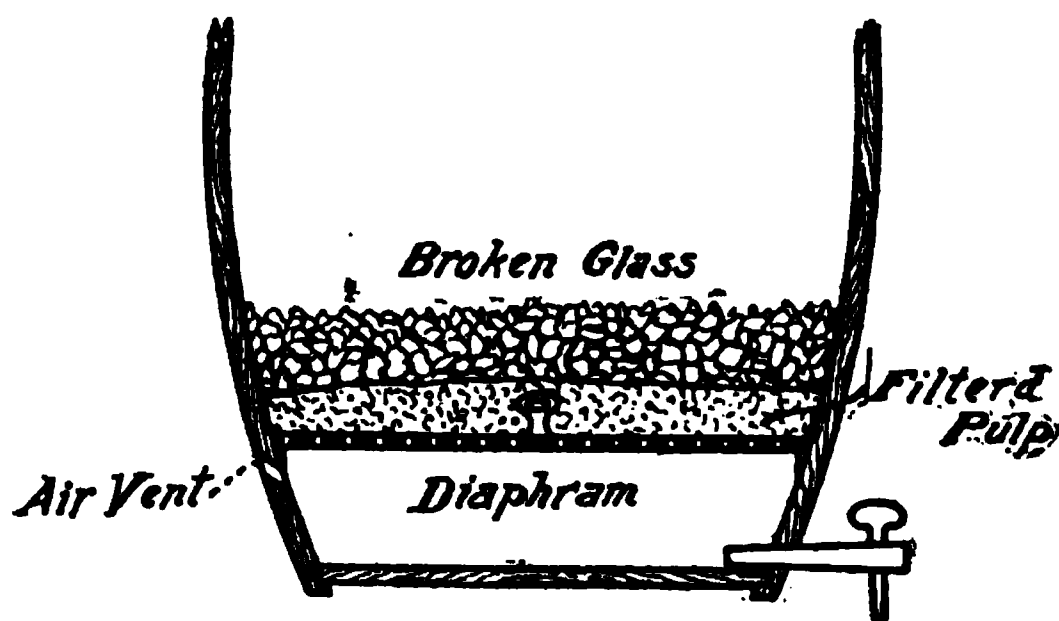
It will be seen from the above figures that—(1) Those vegetables easily attacked by frost, *e. g.*, vegetable marrow, have the higher freezing-points ; (2) the sap in the parts exposed to the air has the same freezing-point, *e. g.*, fruit and stalk of the turnip and marrow ; while (3) those plants which have a portion in the ground, *e. g.*, celery and carrot, or protected, *e. g.*, cabbage heart, the sap in these portions freezes sooner than the exposed. It is very possible that these differences can be accounted for by the fact that the hardy exposed parts contain a more concentrated sap, since more evaporation goes on there ; also, pear juice, containing more dissolved, uncrystallized matter, freezes lower than apple juice.—*Chem. News.*, Nov. 15, 1901, 234.

Cucumber Juice—Preparation.—B. S. Cooban gives the following directions for preparing cucumber juice suitable for various toilet preparations (see *Astringent Wash*, under “Lotiones”) : Slice any convenient number of cucumbers, without peeling ; place in porcelain kettle, and add just enough water to keep from burning. Cook until pulpy, and strain with force through muslin. Preserve by addition of boric or salicylic acid.—*Bull. Pharm.* April, 1902, 159.

Fruit Juices—Clarification.—“L.” gives a detailed description of the filtering arrangement employed by him for clarifying raspberry and other fruit juices, which is shown by Fig. 44. An ordinary barrel is provided with a perforated false bottom, resting on a ledge situated about 15 Cm. above the bottom and having a handle attached in the center of its periphery to facilitate its insertion and removal. An air-hole is bored slantingly downward just beneath the false bottom, and a faucet is inserted just over the bottom for the removal of the filtrate. The filtering medium is paper pulp, enclosed in cheese cloth (gauze) and weighted down with broken glass or crockery. To prepare the filter, the gauze, large enough to fold over, is spread evenly over the false bottom, covered with good filter paper

over its entire surface, and a thickness of about 3 Cm. of well-prepared pulp is then laid on the filter paper, observing that it shall be evenly distributed, and shall touch the sides of the barrel perfectly, so as to leave no openings through which the unfiltered juice may escape into the receptacle beneath. The gauze is then folded over carefully, and the well-washed broken glass placed on it in such quantity that the pulp may remain undisturbed during the pouring in of the juice—laying them with particular compactness on the line of contact with the sides of the barrel. The first

FIG. 44.



portions of filtrate, unless absolutely clear, are returned to the filter. If, as is inevitable, the filtration becomes sluggish, the filter may be restored by carefully removing the glass, washing them, removing the gauze and filter pulp, and washing the latter in a large vessel with water, by decantation, until the water passes clear. It may then be again used for preparing the filter as originally.—Pharm. Ztg., Nov. 16, 1901, 915.

Inspissated Fruit Juices—Improved Method of Preparation.—E. Asper observes that while the number of inspissated fruit juices has been reduced in the Pharm. Germ. to a single one, *Succus juniperi*, there is considerable demand in some localities for others, such as *Succus Dauci*, *Sambuci*, *Sorborum Rhamni cath.*, etc. As commonly prepared, these condensed juices do not form clear solutions, and are unstable. If, however, instead of pursuing the customary method, the fruits are pulped, allowed to stand two or three days, expressed, the juice mixed with 10 per cent. of sugar and allowed to stand in bottle until completely fermented, and then filtered, a perfectly clear filtrate is obtained, which when concentrated in the usual manner, after the addition of a little sugar, honey or glucose to replace that lost by fermentation, furnishes an unexceptionable product, which forms an absolutely clear solution with water.—Pharm. Ztg., Jan. 25, 1902, 74.

SUPPOSITORIA.

Suppositories—Preparation in Capsule Form.—F. Ax recommends that

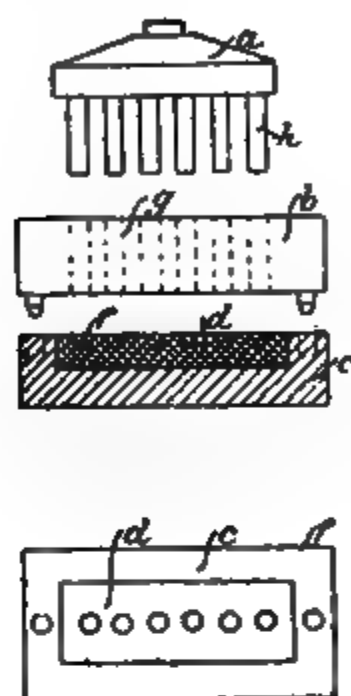
the suppository mass, made by melting cacao fat and introducing the medicinal ingredients in the well-known way, be introduced into gelatin capsules. These are specially made for this purpose with an easily soluble gelatin mass, are very thin-walled, and vary in capacities from 1 to 2, 3 and 4 Gm. The suppository mass is poured into them at near its congealing point, while still fluid.—Pharm. Ztg., Mar. 5, 1902, 181.

Suppositories—Manipulation when Made by the Cold Process.—In the course of his observations on “the best routine method of making suppositories,” Luther F. Stevens gives the following directions for manipulating when these medicaments are made by the cold process with cacao butter as base: The active ingredient having been thoroughly triturated, if necessary with sugar of milk, lycopodium or starch, the trituration should be mixed intimately with the excipient (grated cacao butter) by means of a flexible spatula in a mortar of suitable size. Having, say—for 12 cones of 15 grains each—40 to 60 grains of material in which the medicament is well distributed, this can be rapidly diluted with the balance of the suppository mass. It will be found advisable to add 10 minims of castor oil to each 100 grains of mass, and proceed first as in making a pill mass. This quantity of oil is intended for use in a work room having a temperature of between 62 and 70 degrees F. Where the temperature is higher, and at the bedside of the patient, less oil is needed, until at 85 or 90 degrees F. no softening is necessary, as the friction of pestle against mortar will be found to generate heat sufficient to partially melt the mass. In the summer months it will be found advisable to rest the finished suppositories on ice for a short time before sending out. After a good mass has been prepared of the right consistency, proceed to lengthen it by pressure in the hollow of the hand; wrap the pipe in a clean piece of cloth and by hand pressure on the counter roll the mass out, while still in the cloth, to the length desired; then unwrap and finish the pipe by hand and spatula on a tile or pill machine, using starch or lycopodium as a dusting powder. On a graduated tile or pill cutter, gauged for 5-grain quinine pills, cut at every third line for a 15-grain suppository; for 30-grain suppositories cut at the fourth line. Then shape with two spatulas, one to keep the butt end well set up and the other to form the mass into a cone.—Amer. Drugg., April 14, 1902, 189.

Suppository Mold—Practical Construction.—Otto Vogtherr has devised a compression suppository mold, the essential parts of which are illustrated by the corresponding cut (Fig. 45). It is composed of three parts: *a*, *b*, *c*. The central piece (*b*) is constructed of hard wood, preferably of guaiac wood, and is provided with six or more cylindrical holes (*g*), having the same diameter throughout, into which the plungers (*h*) of the cover (*a*) fit accurately but comfortably. The central part of the base (*c*), is constructed of either wood or metal, into which a plate of rubber (*d*) is embedded, this plate being provided with cone-shaped cavities (*b*),

conforming in the number, position and diameter to the cylindrical holes in the central part, which is held in position, when in use, by set-bolts fitting into corresponding holes in the base. The mold having been filled with the ingredients for suppositories, these are compressed by a sharp blow on the previously adjusted plunger cover. In consequence of the

FIG. 45.



Suppository Mold.

elasticity of the caoutchouc, the adhesion of the suppository to the sides of the mold is overcome and the finished suppository is easily removed and perfect in shape. It is advantageous to dust the mold with rice flour or lycopodium before each operation.—Pharm. Ztg., July 17, 1901, 573.

Suppositories—A New Base.—Ed. Crouzel recommends a mixture of one part of paraffin and three parts of anhydrous lanolin as a base for suppositories, and claims that it possesses certain advantages over all the other bases heretofore recommended. The miscibility of the anhydrous lanolin with aqueous fluids, extracts, &c., and the plasticity of the paraffin-lanolin base itself, facilitate its use in many instances in which cacao fat, by itself or in admixture with wax or lanolin, mixtures of tallow and wax, of vaselin and wax, or the gelatin or agar-agar and glycerin bases, soap and glycerin, &c., will not serve as well, or will be altogether inadmissible.—Pharm. Ztg., Jan. 25, 1902, 73; from Rép. de Pharm., 1902, 1.

Cacaoline—A Suppository Substitute for Oil of Theobroma.—K. Dieterich calls attention to "cacaoline," offered and recommended as a substitute for cacao fat in suppositories. It is devoid of the pleasant odor and taste of cacao fat, is pale yellow in color, becomes brittle at 15° C., and compared with cacao fat, has very high saponification and acid numbers. Similarity exists only in the name and melting points of the two

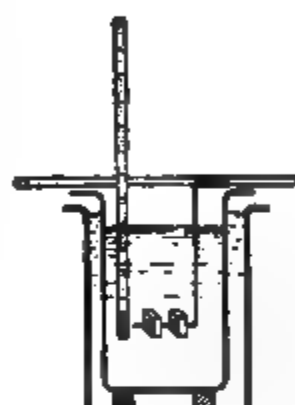
substances.—Pharm. Centralh., Aug. 8, 1901, 485; from Helf. Annal., 1901.

Another substitute for cacao-fat in suppositories is highly lauded for this purpose under the name of

Nubur, a preparation obtained from "coco-nut" fat. This preparation is readily distinguished from true cacao-fat by the great difference in the values of its constants.—Pharm. Centralh., Aug. 22, 1901, 516; from Pharm. Post., 1901, 417.

Gelatin Masses—Determination of Melting Points.—N. Chercheftsky has devised the simple apparatus, shown by Fig. 46, for determining the melting point of gelatin masses according to the method recently proposed by v. d. Wieden. The essential parts are two beakers of suitable size, the inner one resting on small sections of cork, the outer one on a tripod enclosing a Bunsen burner. A stout glass rod, to which a brass wire, bent at right angles and reaching two-thirds downward into the beaker, is attached, is placed horizontally over the inner beaker, which is filled to two-thirds its height with clarified liquid petrolatum, the outer beaker with water. A thermometer is also attached to the horizontal rod, so that the mercury bulb shall be near and on a line with the pointed shank of the brass wire. The gelatin mass is cut into small cubes, two or more being strung on the wire shank, but so that they shall not be in contact with each other, and heat is then applied. When these cubes begin to lose their geometric form and begin to drop from the wire, the temperature noted is accepted as the melting point.—Pharm. Ztg., July 6, 1901, 542; from Chem. Ztg., 1901, No. 38.

FIG. 46.



Gelatin Apparatus.

SYRUPI.

Syrup—Continuous and Automatic Preparation.—F. B. Rayndale suggests the continuous and automatic preparation of simple syrup by utilizing Squibb's siphon or "well-tube" percolator (illustrated in works on pharmacy under "Percolation"). The filtering medium—flannel—may be conveniently replaced by picked manila rope, which is coarser and better adapted. The percolation of sugar, with water in proper proportion, having once been started, it becomes continuous by adding sugar and water as required. An ordinary crock, a well-tube, and a syphon, answer excellently. A cover should be provided to keep the flies out.—Bull. Pharm., June, 1902, 1248.

Fresh Fruit Syrups—Preparation.—Wallace O'Drake finds the aid of a

“Universal” food chopper and an “Enterprise” cherry-stoner to serve excellently in preparing fresh fruit syrups for the soda fountain, and gives explicit directions for their use. The method employed for making

Fresh Pineapple Syrup may serve as an illustration. Select a choice pineapple of good quality and ripe. One costing about thirty cents in proper season will make a gallon of syrup. Wash it thoroughly; then with a sharp knife remove the outer skin in a thin peeling. This is discarded. Now take a thicker slice from the outside of the fruit, just deep enough to include the eyes, and retain these in one of the pitcher containers. Now slice the remainder of the fruit down to the core, and retain these slices in another pitcher. The slices containing the eyes and the core are now passed through the chopper, using the fine knives. A large amount of juice and pulp is obtained. Place in cheese cloth to strain, squeeze the pulp until it is free from juice and reject it. The second slicing is passed through the fine knives of the chopper and mixed with the juice already obtained. To the whole is then added enough rock candy syrup to make a gallon. Strawberry and cherry syrups are made in a similar manner, the cherry stones coming into use for the latter; but in both cases the fruit is to be finely chopped as in the case of pineapple.—West. Drugg., April, 1902, 182.

Cane Sugar Syrup—Test for the Presence of “Commercial” Glucose.—Reviewing a controversy concerning the alleged presence of “commercial” glucose in rock candy syrup, based upon the reduction of silver nitrate or applying the pharmacopœial test for the presence of invert sugar, Joseph L. Mayer brings evidence that this test is fallacious in so far as its adaptability to the identification of commercial glucose is concerned. Neither the reduction of silver nitrate nor of copper sulphate give a clue to the identity of the reducing sugar. The chemist obtaining a reduction resorts to other tests to differentiate the various sugars, in some cases quite simple, while other indications are the nature and extent of the effect of a solution of the sugar on polarized light. Cane sugar deflects the ray to the right, dextrose to the right, levulose to the left, and commercial glucose strongly to the right. Each sugar influences the light in a different degree; consequently the method is an ideal one for chemists, but is not suited for pharmacists, objection being the cost of a polariscope and unfamiliarity with the instrument. The chief chemical tests employed have for their basis the fact that dextrin is always a constituent of commercial glucose, constituting sometimes fifty per cent. of it. Precipitation by alcohol fails to yield decided results, but the iodine test, as carried out in the following manner recommended by Prof. H. A. Weber, has proven very successful in the author’s hands:

Fill a watch glass half-full of the syrup to be tested, then add eight or ten drops of a saturated solution of iodine in 50 per cent. alcohol; if the sample is free from glucose the iodine is dissipated after a short time and

brown or contains a brown precipitate, the color being best observed by placing the watch glass on a sheet of white paper.—Drugg. Circ., Feb., 1902, 27.

Aromatic Syrup of Cascara, B. P.—Improved Formula.—Bridget Rose Clinton interestingly discusses the subject of cascara sagrada with particular reference to the aromatic syrup of the B. P. The formula, which is of American origin, is a failure, and the purpose of her paper is to rectify its errors and to present one that may prove more satisfactory. Eight formulas are produced and commented on in succession, the following being the one preferred by the author: Ext. cascarae liq., $\mathfrak{z}\text{i}$; Extr. glycyrrhiz. liq, $\mathfrak{z}\text{ij}$; Ol. coriandi, $\mathfrak{m}\text{ij}$; Ol. anisi, $\mathfrak{m}\text{ij}$; Ol. cassiae, $\mathfrak{m}\text{i}$; Tr. aurantii, $\mathfrak{z}\text{iv}$; Ol. aurantii, $\mathfrak{m}\text{i}$; syrupi ad $\mathfrak{z}\text{ijss}$.—Trans. Brit. Pharm. Conf., 1901, 344-349.

Syrupus Ferri Quininae et Strychninae Phosphatum—Practical Suggestion to Avoid Caramelization.—Charles H. LaWall reviews the various changes in formula which this syrup has undergone since its formula was first proposed by Dr. Aiken—changes which have been mainly suggested on account of its instability. The most serious difficulty encountered is, as has recently been shown by F. W. Haussmann, its liability to darken in color on account of the caramelization of the sugar. As the official (U. S. P.) formula stands at present, the preparation, with this exception, is fairly permanent, other unfavorable conditions being due to failure to employ pure material. These conditions being avoided by careful selection of the ingredients, it is suggested by the author that the one unfavorable condition beyond control after the syrup is finished may also be eliminated, in a very simple manner, by dividing the formula—making a concentrated preparation of the iron phosphate, quinine, strychnine and glycerin, and diluting this with syrup as required in dispensing. This concentrated glycerole is made up according to the U. S. P. directions for making the syrup, making up the measure to 250 Cc. with glycerin. Then, as needed, this is diluted with three times its volume of pure simple syrup. The glycerole prepared in this manner, using the official proportions and quality of ingredients, has been kept in an undiluted condition for three months without alteration, and doubtless forms a practical means of overcoming a hitherto insurmountable difficulty.—Amer. Journ. Pharm., Sept., 1901, 446-448.

Syrup of Heroin and Bromoform—Formula.—Lorot recommends a syrup containing heroin and bromoform for allaying the cough of consumptives and the whooping cough of children. It is prepared of the strength of 0.005 Gm. heroin hydrochloride and 0.15 Gm. bromoform to a teaspoonful, which is the ordinary adult dose for consumptives, 4 to 6 times daily. For children it is reduced in strength with five times its vol-

ume of syrup of tolu.—Pharm. Centralh., Sept. 12, 1901, 574 ; from Münch. Med. Wochenschr., 1901, 1267.

Syrup of Hypophosphites, U. S. P., 1890—Improved Manipulation.—E. Claassen recommends the following in preparing the official syrup of hypophosphites: Triturate the hypophosphites with the water, add the spirit of lemon, the hypophosphorous acid and the (granulated) sugar, dissolve the last by agitation and pass the syrup through a folded and moistened filter, adding enough water through the filter to make the product measure the required amount.—Pharm. Rev., Aug., 1901, 351.

Syrup of Hypophosphites, U. S. P.—Modified Formula.—H. C. Bradford finds the following modification of the U. S. P. formula for syrup of hypophosphites, in which the quantity of hypophosphorous acid is decidedly increased, to give a more satisfactory preparation than the official one :

Calcium hypophosphite	45 Gm.
Potassium hypophosphite.....	15 Gm.
Sodium hypophosphite	15 Gm.
Hypophosphorous acid, dilute.....	10 Cc.
Sugar.....	600 Cc.
Aromatic spirit.....	10 Cc.
Water, enough to make	1000 Cc.

Manipulate as directed by the Pharmacopœia. The author also has abandoned the formula for

Compound Syrup of Hypophosphites, N. F., and recommends the following as being in every way superior :

Potassium hypophosphite.....	256	grs.
Calcium hypophosphite	256	grs.
Sodium hypophosphite.....	64	grs.
Iron hypophosphite	128	grs.
Manganese hypophosphite.. ..	64	grs.
Strychnine hypophosphite	2	grs.
Quinine hypophosphite	64	grs.
Potassium citrate.....	240	grs.
Citric acid	80	grs.
Sugar.....	3½	lb.
Oil lemon.....	30	gtt.
Water, enough to make	4	pts.

Dissolve the calcium, potassium and sodium salts in 1 pint of distilled water. Put the manganese and iron, potassium citrate and citric acid into an evaporating dish with 8 ounces of water, and heat gently until dissolved. Mix this with the first solution and add to it the quinine and strychnine dissolved in 8 ounces of water, using heat if necessary. Incorporate the oil of lemon with the sugar and filter on it the hypophosphite solution. Dissolve, strain, and pass through the strainer enough water to make 4 pints.—West Drugg., June, 1902, 302-303.

Syrup of Orange Flowers—Expeditious Method of Preparation.—A. C. Abraham has for years made syrup of orange flowers, satisfactorily and expeditiously, by the following process, which he recommends as an improvement of that now official in the B. P. : Triturate one pound of sugar with 8 fl. ozs. of orange-flower water, add 3 lbs. of simple syrup, mix, and strain. It can thus be made in five minutes.—Pharm. Journ., March 29, 1902, 255.

Syrup of Orange Flower, B. P.—Improved Manipulation.—W. Lyon points out some objections to the official manipulation directed for preparing orange-flower syrup, and recommends the following method : Put the prescribed quantities of sugar, orange-flower water and cold distilled water into a bottle filled with a tight stopper or cork, and shake occasionally in a warm place until the sugar is dissolved.—Pharm. Jour., Mar. 1, 1902, 174.

Compound Syrup of Squill, U. S. P.—Improved Manipulation.—E. Claassen recommends that compound syrup of squill be prepared as follows : Mix the evaporated fluid extracts, while yet hot, with the antimony and potassium tartrate and the proper amount of water, allow the mixture to stand over night, pass at first the liquid part through the filter and then pour on it the sediment. After having washed the latter with as much water as necessary to furnish the desired quantity of filtrate, dissolve in it the (granulated) sugar, strain, lastly adding to the strained liquid (through the strainer) as much water as sufficient to make the product measure the required number of cubic centimeters.—Pharm. Rev., Aug., 1901, 351.

Yellow Syrup of Tolu—Preparation.—John H. Haydon, Jr., calls attention to the fact that when magnesium carbonate is substituted for calcium phosphate in the formula for syrup of tolu, a yellow instead of a colorless syrup is obtained,—Amer. Drugg., Sept. 23, 1901, 169.

Syrup of Tolu—Manipulation Necessary to Insure a Non-crystallizable Product.—Frank B. Styles communicates his method of preparing syrup of tolu according to the U. S. P. formula, whereby he uniformly avoids the formation of crystals in the finished product. It is sufficient to say that he insists on the complete dissipation of the alcohol used to dissolve the balsam of tolu, by exposure of the mixture of sugar and calcium phosphate containing it until a dusty-dry powder remains, which is then introduced with the remainder of the sugar into a percolator, plugged with a sponge of good shape and texture, and percolated with the specified quantity of water. For the details the original paper must be consulted in Bull. Pharm., Aug., 1901, 319–320.

Worm Syrup—Original Formula.—The following formula for “Exit Worm Syrup” is given in “Amer. Druggist” (Dec. 23, 1901, 377) :

Fluid extract of spigelia.....	5 oza.
Fluid extract of burdock	2 oza.
Oil of anise.....	10 minims.
Oil of caraway.....	10 minims.
Syrup	8 oza.

M. Dose, a teaspoonful.

TABLETTA.

Compressed Tablets, Pills and Encapsulated Powders—Ratio of Disintegration.—In an interesting review of the modern tendency of "dry medication" in its relations to therapeutics and pharmacy, which must be referred to in the original, Prof. C. S. N. Hallberg publishes the comparative exhibit of the ratio of disintegration and solution of compressed tablets shown in the table given below and proposes general formulas for troches (pastilles), tablets, powders, capsules, pills, etc. These dry forms of medication are increasing in favor owing to several causes—such as portability and seeming stability, concentration and seeming accuracy, convenience of dosage and economy, and are specifically necessary because of the introduction of synthetical products, nearly all of which are comparatively insoluble in water, and because their administration in solution form in alcohol and other solvents is impracticable in most cases.

Serial Number.	MEDICINAL AGENT.	FORM.	APPROXIMATE PERCENTAGE RATIO OF DIS-INTEGRATION AND SOLUTION IN 30- AND 60-MINUTE PERIODS.				Residue 1.
			A: In Liq				
			30 Min.	60 Min.	90 Min.	120 Min.	
3	Acetanilid, 5 gr.....	Tablet.	5	5	5	10	
4	Calomel, 3 gr.....	Pill. G. C.	10	20	30	45	c. d.
5	Cinchonidine Salicylate, 2½ gr.	Pill. G. C.	10	10	15	35	
6	Guaiacol Carbonate, 3 gr.....	Pill. Sol. C.				5	
7	"Migrainin," 5 gr.....	Tablet.	50	50	50	50	
8	Phenacetin, 5 gr.....	Powder G. C.	50	50	50	50	c. d.
9	Phenacetin, 5 gr.....	Tablet.	5	5	5	5	
10	Phenacetin, Salol, ea. 2½ gr.	Tablet.	5	5	5	5	
11	Phenacetin and Salol	Pill. Sol. C.				10	
12	Phenacetin, 3 gr. } Caffeine Cit., ½ gr. }	Tablet.	5	10	15	35	
13	Salol, 5 gr.....	Tablet.			5	15	
14	Salol, 2½ gr.....	Pill. Sol. C.		5	20	45	
15	Salophen, 2½ gr.....	Pill. Sol. C.		25	50	50	c. d.
16	Terpin Hyd., 5 gr. } Codeine, ¼ gr. }	Pill. Sol. C.					

1. c. d. means that the residue was completely disintegrated.

2. Salol residue showed separation of oily globules of phenol.

From the results shown in the table and other experiments and observations made by the author, he concludes that the *compressed tablet form*

of dry medication is the least desirable, and that *tablet triturate* form is the only form adapted for the internal administration of medicinal agents, since, owing to the relatively large proportion of milk sugar, and the preparation, there is little danger of its forming a hard, insoluble mass. *Hypodermic tablets* are also serviceable and unobjectionable, and they represent the only legitimate use of compressed tablets, namely, a convenient form of dosage for the extemporaneous preparation of solutions.—Merck's Rep., July, 1901, 211.

Compressed Tablets—Importance of Granulating the Ingredients.—Frank Edel, basing his observations on an experience of six years in the manufacture of compressed tablets, offers the following practical suggestions: (1) The tablets should be compressed firmly enough to make them hard, permanent and sightly. (2) No adhesive excipient should be used that interferes to the slightest extent with the solubility of the tablet. He has found it impossible to get satisfactory results with any of the machines on the market unless the powder was first properly granulated and dried. The principal trouble is in the drying, it being a matter of difficulty to properly regulate the heat, and few or none of the different makes of drying ovens are satisfactory in this respect. He has constructed a drying oven or closet of his own design, which he has found very convenient in practice. It consists of a box 36 inches long, 22 inches high, and 28 inches wide, one end being fitted with a drop door and the other with swinging doors. Skeleton shelves, with a cheese-cloth floor, are fitted to slide in at the front, and go back to within 10 inches of the drop door at the back. The shelves are situated 2 inches apart, the first shelf being 3 inches from the top. The back door and the interior of the box for 10 inches are covered with asbestos paper. This completes the drying oven proper, but an important part of the equipment is the lamp. In order to obtain a heat that could be easily regulated he took four No. 2 sun burners and fitted them to a copper reservoir, made so as to fit snugly into the rear part of the drying oven. The burners were fitted with long glass chimneys, and holes were cut in the top of the oven directly over each chimney. Then by placing the granulated powder on a sheet of white paper and laying this in turn on the cheese-cloth-covered frame, the process of drying may begin, the reservoir having of course been filled with coal oil and the lamps trimmed. These are lighted, turned low and placed in the oven, and the doors closed. The heat being regulated by simply lowering or raising the wick of the lamp, any ordinary granulated powders can be dried to a nicety, and by using a Stokes machine for compressing the tablets, there is no trouble to turn out from 60 to 80 tablets a minute.—Amer. Drugg., Nov. 25, 1901, 311.

Compressed Tablets—Solubility an Essential Quality.—Anthony M. Hance discusses the essential characters of compressed tablets in a paper read before the Philadelphia College of Pharmacy. The one all-impor-

tant and indispensable quality is solubility. A tablet may be made ever so accurately and conscientiously with respect to purity of materials, skill in manipulation, faultless check system to guard against error, uniformity in weight and size and handsome appearance; but, if the one quality of solubility is wanting, it is not a good tablet. For special purposes, such as the treatment of throat diseases, slow disintegration is a desirable quality; but in all other cases the compressed tablet should rapidly disintegrate when dropped into a quantity of water. To obtain this result each tablet must be studied separately, as each combination has a distinct individuality arising from the nature of its component parts. The author, however, fails to give any special formulas illustrative of his subject, confining his remarks to generalization.—*Amer. Journ. Pharm.*, Feb., 1902, 80–82.

Tablets—Necessity of a Scheme for Distinguishing Different Kinds.—Seward W. Williams says that of the thousands of tablets and tablet triturates in use, very few possess any distinctive features, except where color or taste assert themselves, and even these, in the case of tablets and pills, are commonly suppressed by coating. Not only are qualitative differences obliterated, but quantitative distinctions as well, there commonly being no difference in size corresponding to the amount of active agent present. It would seem, therefore, that some scheme for individualizing or closely classifying these tablets by means of color, form or imprint (imprint is doubtless best) should be adopted. Such a plan, to be capable of general adoption, should receive the endorsement of some generally recognized authority, as the Pharmacopœia or National Formulary. Otherwise, manufacturers, naturally averse to copying each other, may each adopt a system of his own, with a resulting confusion approaching in danger the existing sameness. An official endorsement of a plan, formulated with the coöperation of those most interested, should be sufficient to insure unity of action, should action after thorough consideration be deemed desirable. Ten years from now the question may present insuperable complications. In the case of tablets generally, however desirable distinctive features may be, from considerations of public safety, they are evidently out of the question. The doctors have settled this point. There seems no reason, however, why objections should be raised in any quarter against a practical plan, if such can be devised and generally agreed upon, for individualizing, in so far as possible, tablets which never go as such to the patient and which are handled only by the pharmacist.—*Amer. Drugg.*, Aug. 12, 1902, 71–72.

TINCTURE.

Tinctures—Preparation from Fluid Extract.—Referring to an article condemning the use of fluid extracts for preparing tinctures, Isaac Mosheim Weills makes some remarks pertinent to the subject, in which he defends the use of fluid extracts for this and similar purposes on the ground that these,

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		Drug.	Tincture.
	Grammes.	Per cent.	Grammes.
Benzoin.....	100	85	85.0
Prepared storax	75.0	80	60.0
Balsam of tolu	25.0	90	22.5
Socotrine aloes.....	18.3	90	16.5
Per litre.....	218.3		184.0

A sample of tincture prepared by the authors, without special care as to quality of drugs, yielded 182 grammes per liter. Sp. gr. 0.896 at 60° C. (*sic*). Out of 25 samples purchased officially by the Birmingham Food and Drug Inspector during the last two years, 13 yielded between 180 and 187 grammes of dry extract per liter; 1 sample gave 153 grammes and was passed as of low quality; whilst 2 samples below this caused the vendors to be heavily fined.—Pharm. Journ., Jan. 11, 1902, 21; from Analyst, 26, 283.

Tincture of Catechu—Method of Identification.—Bourquelot recommends that tincture of catechu be very considerably diluted when applying the test of identity prescribed by the Pharm. Germ. IV. Ten drops of the tincture are added to 20 Cc. of water, 5 drops of a 5 per cent. solution of potassium chromate are added, and the mixture is heated to boiling. The characteristic cherry red color is thus developed much handsomer than if the undiluted tincture is treated.—Pharm. Ztg., May 3, 1902, 346; from Journ. de Pharm., 1902, xv, No. 7.

Tinctura Chloroformi et Morphinae Composita, B. P., 1898—Improved Formula.—W. Lyon considers it desirable that the formula for compound tincture of chloroform and morphine be so constructed as to resemble the 1885 preparation in appearance, but may be given in doses of 20 to 30 drops instead of 10 drop doses. He finds that the following formula gives a reliable preparation, which does not separate, and is miscible with water:

Chloroform	60 Cc.
Morphine hydrochloride	5 Gm.
Diluted hydrocyanic acid.....	45 Cc.
Tincture of Indian hemp.....	30 Cc.
Tincture of capsaicum	15 Cc.
Oil of peppermint	1 Cc.
Mucilage of gum acacia.....	120 Cc.
Treacle	240 Cc.
Liquid extract of liquorice.....	120 Cc.
Glycerin	210 Cc.
Alcohol (90 per cent.).....	154 Cc.

Or sufficient to produce 1 liter.

—Pharm. Jour., June 21, 1902, 581.

by John H. Hayden, Jr., for "Elix. of Hyoscin" and "Elix. of Hyoscin and Terpin Hydrate," he requires a brown coloring agent, a formula for which he has devised under the name of "Compound Tincture of Curcuma." It is prepared as follows:

Curcuma.....	3x.
Macerate for seven days in a menstruum of	
Alcohol	fl. ℥ viij.
Water	fl. ℥ viij.
Filter and add	
Caramel....	fl. 3x.
Menstruum enough to make.....	℥i.

The coloring possesses several advantages over caramel. It is brighter and more easily measured.—*Amer. Drugg.*, July 22, 1902, 37.

Tincture of Fresh Hyoscyamus—Comparison with the Official (B. P.) Tincture.—John Barclay prepared tinctures from fresh hyoscyamus in two examples, No. 1 being made from "stalky" plants, No. 2 from well-grown and more "leafy" plants. One pound of the fresh herb, consisting of stalks and leaves, was, after being thoroughly crushed, macerated for about ten days in a pint of 90 per cent. alcohol. The tincture was then strained from the marc, and the latter treated with 4 fl. oz. of distilled water, after which it was again closely pressed. As a result, two lots of tinctures, each measuring 33¾ fl. oz., and weighing 2 lbs., were obtained. The tinctures proved to have the following characters:

	No. 1.	No. 2.
Sp. gr. at 15.5° C	0.949	0.948
Total solid matter dried at 100° C.	2.23	2.82
Total alkaloid by titration	0.0075	0.0097

The tincture prepared by the official method from dried drug of good quality gives figures of which the following may be taken as fair averages:

Sp. gr.	0.957
Total solid matter	3.00
Total alkaloid by titration.....	0.008

A comparison of these figures shows that in the tincture from the fresh herb the proportion of alkaloid to total dissolved matter is considerably higher than is the case with the official preparation. It may be noted, too, that the "fresh" tincture is superior in both aroma and in color to the "dried" preparation.—*Chem. and Drugg.*, June 7, 1902, 893.

Tincture of Iceland Moss—Therapeutic Use.—It is stated in "*Ztschr. d. Allg. Oester. Apoth.-Ver.* (1901, 693), that an alcoholic tincture of Iceland moss is an efficient remedy for nausea and vomiting, particularly

that of pregnancy. The tincture contains, besides cetrarin, the bitter principle of the moss, only wax, chlorophyll and calcium salts.—Pharm. Centralh., Sept. 26, 1901, 600.

Tincture of Iodine—Objection to Wood Alcohol for its Preparation.—In the experience of Frederick T. Gordon in a number of cases, tincture of iodine prepared with wood alcohol is decidedly caustic and is very irritating in its effect. From experiments made, he finds that iodine dissolved in wood alcohol will produce, in time, formaldehyde and formic acid, both of which have been separated from a tincture after several weeks standing, and there is no doubt that these are the cause of the irritant effect of the wood alcohol tincture, as well as of the extremely pungent and irritant fumes evolved by it.—Proc. Pa. Pharm. Assoc., 1901, 119–120.

Tincture of Nux Vomica—Method of Identification.—In place of the brucine reaction prescribed by the Pharm. Germ., IV., for the identification of tincture of nux vomica, Bourquelot proposes its identification by determining the loganine present. To 10 drops of the tincture, in a porcelain capsule, 3 drops of diluted sulphuric acid (1 : 3) are added, mixture is effected and the liquid distributed over as large a surface as possible by suitably rotating the capsule, and the alcohol is evaporated by careful heating. The mixture thus assumes a violet-red coloration.—Pharm. Ztg., May 3, 1902, 346 ; from Journ. de Pharm., 1902, xv, No. 7.

Tincture of Opium—Presence of Sulphuric Acid (Sulphate) in Commercial Samples.—F. M. Alcock, in the course of some experiments with tincture of opium, observed that all the samples contained marked quantities of sulphate. In order to ascertain the amount present in ordinary trade samples (in England) a series of six were obtained from widely different sources, and it was found that there was not a great variation in the quantity of barium sulphate yielded by each sample on adding barium chloride to 10 Cc. of the tincture, previously diluted with water and acidulated with hydrochloric acid. The precipitates, collected, washed, dried, and ignited, weighed respectively 0.055, 0.043, 0.083, 0.039, 0.036, and 0.042 Gm.—Pharm. Journ., Oct. 26, 1901, 476.

Deodorized Liquid and Tincture of Opium—Historical and Practical Observations.—Albert E. Ebert, interestingly reviews the history of deodorized opium preparations, beginning with the introduction of "Liquor Opii Sedativus," by R. Battley, of London, England, to the present day, and makes some practical remarks concerning the preparation of deodorized opium, of a concentrated liquid (stock) preparation of the same, and of the deodorized tincture. Without going into particulars, which must be referred to in the author's very exhaustive paper, it may be mentioned that of the various solvents for removing the resinous and odorous principles of opium, paraffin or paraffin oils are rejected because of their

to dissolve some of the morphine—as is shown in three different ways—while preference is given over all others to “gasoline” because it alone removes the objectionable, nauseating and odorous substances not only, *but also because it possesses the least solvent action upon the narcotine*. For, contrary to the commonly accepted view, Mr. Ebert holds the opinion that the *narcotine is an important and essential constituent of these opium preparations*. As pointed out by Robiquet in 1821, and afterwards by Dr. Magendie, “*narcotine acts as a stimulant, while morphine is the real anodyne which induces calm sleep*.” But Mr. Ebert goes further, and says that he firmly believes narcotine to be a valuable medicinal agent in the treatment of the habits of opium, alcohol and tobacco.

He has known it to produce good effects in such cases when administered in grain doses every hour for 30 to 60 doses. The name

narcotine, originally given to this principle, as now well recognized, is a misnomer, since it is entirely destitute of narcotic properties. On the other hand, it performs the functions of a pure stimulant tonic, and is the principle which prevents the depression that always occurs when morphine is administered alone. It follows that this principle, instead of being rejected, should not alone be retained, but care should be taken that the narcotine in the opium shall be contained in the preparations made with it.

Applying these observations to the practical process of making deodorized opium preparations, after an experience in their manufacture of over twenty-two years, Mr. Ebert recommends a

Concentrated Liquid Opium, which is satisfactorily obtained by the following process :

Take the moist opium, place it in a glass, stone or porcelain dish, and by means of a water-bath macerate the opium with four parts of hot water for twelve hours, or until the mass is thoroughly disintegrated. Pour upon a colander and with stirring and pressure of the hand drain off the liquid. Return the still warm residue to the dish, pour upon it two parts of hot water, macerate again for several hours, keeping up the heat by means of the water-bath. Again transfer to the colander, press and drain off the liquid as before, repeating the operation with two parts of hot water, and finish as in the previous proceedings. Mix the liquids obtained from the different operations together, pass through a cloth strainer and thence to concentrate by evaporation to half the bulk of the water employed for extraction. Now take one part of diluted acetic acid and pour it upon the opium residue, macerate on a water bath for twelve hours, place the magma upon a coarse cloth strainer and drain off the liquid with pressure. Evaporate this acid liquid on a water bath to dryness, add the dry extract to the liquid being evaporated, and when the latter is reduced to four parts by measure pour in cool. Then add an equal volume of “gasoline,” let it stand

twelve hours (after shaking?—Reporter), separate the gasoline, pass the opium solution through a paper filter and evaporate it to half its bulk. Now make a morphine assay and add sufficient diluted alcohol to make the finished liquid opium have a morphine strength of 24 grains to the fluid ounce. The product corresponds in morphine strength to the so-called "fluid extract of opium" listed by some of the manufacturers. When made of greater concentration than four parts by measure to one part of opium used, there will be a crystalline separation of some of the narcotine—the amount of the latter extracted by the process given being from 5 to 8 per cent., while when water alone is used it only amounts to an average of 3 per cent. This concentrated liquid opium is used with advantage for making various galenical opium preparations, including, of course, the deodorized tincture. Mr. Ebert, however, prefers to use a

Deodorized Granulated Opium, which, under specific directions, is obtained by extracting granular opium with gasoline. The latter should be a high-grade product, and is preferred by him to "benzin," which he originally recommended for deodorizing opium about 32 years ago.—*Amer. Journ. Pharm.*, April, 1902, 157-169.

Tinctura Valerianæ Ammoniata, B. P., 1898—Advantage over the Formula of 1885.—A recent examination of the processes of the B. P., 1885 and 1898 for preparing ammoniated tincture of valerian points out to the satisfaction of W. Lyon that the formula of 1898 (in which the menstruum is ammonia water 1 part, alcohol 9 parts, and oils, instead of aromatic spirits of ammonia! — Rep.) yields a superior product. The amount of extractive is greater, the taste is acrid and sharp instead of bland and soft, and it mixes clear with 5 parts of water, whereas the product of the B. P. 1885 makes a muddy mixture with the same quantity of water.—*Pharm. Journ.*, Oct. 5, 1901, 409.

Tinctura Valerianæ Ammoniata, B. P., 1898—Advantage of a Macero-Percolation Process.—Under the assumption that the addition of liquid ammonia to the spirituous menstruum of ammoniated tincture of valerian is for the purpose of promoting extraction as well as to fortify the stimulant and antispasmodic properties of the tincture, W. Lyon has made some experiments with the object of ascertaining the conditions that best facilitate the extraction by the ammonia. He finds that if the prescribed quantity of ammonia solution, instead of being mixed with the alcohol, is expeditiously mixed with the powdered valerian, packed in a percolator, set aside for twenty-four hours, and then percolated to a finish with the prescribed quantity of alcohol, a tincture is obtained which is stronger in extraction, valerian odor and ammonia than that obtained if the official directions are strictly followed. A tincture prepared by this macero-percolation process yielded 4.65 per cent. of extractive, while one made from the same parcel of valerian by the official process only contained 2.90 per cent. of extractive.—*Pharm. Journ.*, Nov. 30, 1901, 600.

Dr. Sir James Sawyer, discussing the value of medicated lozenges, calls attention to the advantage to medical practitioners if they prescribe lozenges prepared by their own magistral formula, whenever they can, rather than to select from among the list of official lozenges and the many others that are offered. For this purpose he recommends a "basis" which he has found useful for this purpose. This is the

Pasta Glycyrrhizæ Alba, described in Beasley's "Pocket Formulary," which is prepared, similarly to marsh-mallow paste, as follows: Take of decorticated licorice root, 4 ozs.; water, 4 pints. Macerate for 12 hours, strain, add 2½ pounds of picked gum arabic and 2½ pounds of refined sugar, and dissolve; strain, and evaporate the solution to the thickness of honey, constantly stirring, and add gradually the white of twelve eggs well beaten with 4 ozs. of orange (flower ? Rep.) water; evaporated with constant stirring till the paste is so firm as not to adhere to the hands. The physician having decided upon the exhibition of a remedy in the lozenge form, the medicament selected must be combined with this white licorice paste in the process of making, at a time before the paste attains its final consistency. These details being left to the skill of the pharmacist, the prescription, for example, may be prescribed magisterially as follows—borax being the medicament: R. Boracis, gr. ij; pastæ glycyrrhizæ albæ (Beasley), gr. x; misc, fiat trochiscus. Signature: one or two to be slowly sucked, as directed.—Pharm. Journ., Dec. 7, 1901, 640; from Brit. Med. Journ., Nov. 30, 1901.

UNGUENTA.

Ointments of the B. P. 1898—Various Criticisms and Improvements.—W. Lyon makes some criticisms and suggests improvements on the B. P. processes for making the ointments of resin, of carbolic acid, and of zinc oleate. Regarding the

Resin ointment he observes that the official directions are not quite so explicit as they ought to be, and that the process, for retail quantities, can be conveniently shortened as follows: Reduce the resin to fine powder in a mortar, add the olive oil, and triturate until the resin is thoroughly distributed, taking care that none remains adhering to the sides. Now put in the lard, mix thoroughly, and finally add the wax in fine shreds. Triturate again, and then place the mortar in a water-bath. Constant stirring, while it accelerates solution, is not absolutely necessary, but the ointment should be continuously stirred while cooling. As at present prepared officially,

Carbolic Acid Ointment is the subject of frequent complaint on account of its liability to granulate. The disturbing ingredient appears to be the

glycerin. A very satisfactory basis in the author's opinion is a mixture of equal parts by weight of almond oil, white wax and benzoinated lard, the *modus operandi* being as follows: Melt the lard, wax and half the almond oil together on a water-bath. Place the phenol and the remainder of the oil into a stoppered or corked bottle, and effect solution by immersion in hot water. Having removed the melted basis from the water-bath and stirred it continually until it begins to thicken, add the oil and phenol (warm), continue to stir until the ointment is cold, set aside for 24 hours, and again rub it up thoroughly.

Ointment of Zinc Oleate, as obtained from different makers, is darker in color than desirable, a condition which the author attributes to the method of drying the oleate previous to its incorporation with soft paraffin. Drying the oleate on the water-bath, deprives it of its nascent snowy whiteness, and the longer it is left on the water-bath the more difficult it is to melt with the paraffin. To obviate this difficulty, the author has successfully tried to accomplish the removal of the water from the oleate by pressure. When removed from the calico pressing cloth, it was white, apparently quite dry, and the ointment made with it of much better appearance.—Pharm. Journ., Mar. 1, 1902, 174-175.

B. P. Ointments—Criticism of Some Formulas.—A. C. Abraham, referring to Hallberg's unreserved praises of the ointments of the B. P. (see Proceedings, 1901, 610), wonders whether he would do so if he had the experience with them that they have had in England. Some of them are most unscientific and unsatisfactory. Carbolic acid ointment is especially so, and capsicum ointment is a shocking mess. The paraffin ointment basis, although a nice preparation can be made of it, is unnecessarily troublesome, and its composition is founded upon an entire misconception. Speaking of the frequent discussions with reference to the stirring or otherwise of ointments during cooling, his own experience points out that no ointment in the B. P. can be prepared in a state of perfection without stirring, although there may be some which, under special conditions as to quantity, temperature of the air in which they are allowed to cool, and also the nature of the vessel in which they are set to cool may be produced of a very fair quality without stirring.—Pharm. Journ., March 29, 1902, 256.

Unguentum Chrysarobini, B. P., 1898—Difficulty to Comply with the Official Directions.—In the former edition of the B. P. the ingredients for chrysarobin ointment were directed to be heated "so as to promote solution." In the 1898 edition the directions are to "continue the heat until the chrysarobin is dissolved." Calling attention to this difference in the official directions, W. Lyon observes that in his experience a small proportion of the chrysarobin always fails to enter solution, even when the heating is prolonged for several hours. Importance being placed by some

writers on having the chrysarobin in solution, the question arises whether or not the ointment should be strained before finally cooling. From a pharmaceutical standpoint this would undoubtedly be an improvement.—Pharm. Jour., Aug. 24, 1901, 274.

Camphor Ointment—Original Formula.—The following formula for a “camphor ointment” is published in “Amer. Druggist” (Dec. 23, 1901, 377) :

Camphor	1 oz.
Carbolic acid	1 oz.
Acid salicylic.....	2 oz.
Ichthyol	2 oz.
White wax	2 oz.
Sulphur	10 oz.
Zinc oxide	10 oz.
Pine tar.....	10 oz.
Petrolatum	20 oz.

M. Put up in 2 oz. tin boxes.

Cold Cream—Preparation with Mineral Oil.—Clarence Campbell proposes the following formula for cold cream, which is similar to that proposed by Mr. Alpers (see Proceedings, 1901) : Spermaceti, 125 grammes ; white wax, 120 grammes ; mineral oil, 600 Cc. ; stronger rose water, 190 Cc. ; borax, 5 grammes ; oil of rose, Gtt. 5. Cut wax and spermaceti in small pieces, add oil, apply gentle heat, to about 140° F. Dissolve borax in rose water, apply gentle heat, same temperature as wax and oil. Add rose water and borax, previously heated, to the oil and wax without stirring, and then stir rapidly and continuously until mixture becomes uniformly soft and creamy. When cool add oil of rose.—Proc. Pa. Pharm. Assoc., 1901, 169.

Citrine Ointment—Stability of Samples Made in 1898.—Peter W. Squire exhibited at a recent meeting of the Pharm. Soc. of Great Britain (April 15, 1902), two samples of citrine ointment, selected from a large number, which had been prepared by different processes in 1898, preparatory to the revision of his (Squire's) “Companion to the B. P.,” because they were the only samples that had retained their original condition and color. All the other samples had undergone decomposition, varying in color from a dark blue to a black, and retaining not even a trace of the original yellow color. On referring to his notes, he found that the two samples which had kept so well had been made by a process recommended by him in 1897 (see Proceedings, 1897, 405), a modification of the B. P. process, which has been unfavorably criticised on the ground that it produced a more acid preparation than that of the B. P. and that the ointment is liable to have a spongy consistency. In the present paper, Mr. Squire points out that the acidity of the official ointment is about the same as that made by the modified formula, but that the keeping qualities are not so good,

and that the official manipulation is far more difficult.—Pharm. Journ., April 19, 1902, 314.

Mercurial Ointment—Rapid Preparation.—B. van Selms recommends the following method and manipulation for preparing mercury ointment, which, he claims, has enabled him to prepare 5 kg. of the ointment in one hour, a quantity formerly requiring as much as a week: The mercury is heated with one-tenth of its weight of lard on a water-bath, and then rapidly stirred so as to form a superficial mixture; then one-twentieth of olive oil is gradually added, and rapid trituration is continued until the mercury globules are completely extinguished. The remainder of the lard is then incorporated.—Pharm. Centralh., Aug. 29, 1901, 527; from Pharm. Weekbl., 1901, No. 28.

Ointment of Yellow Mercuric Oxide—Reliable Method of Preparation.—Frank Edel observes that however satisfactory the preparation of ointment of yellow oxide of mercury may be when freshly-made moist yellow oxide of mercury is used, the process does not commend itself to the pharmacist who has to make the ointment frequently in small quantities. He finds no difficulty to prepare it from the dry chemically pure mercuric oxide, by triturating the required quantity thoroughly with a little distilled water so as to reduce any gritty particles to an impalpable condition. The perfectly smooth paste is then readily incorporated with the necessary quantity of soft petrolatum, or benzoinated lard, and a product thus obtained that is equal in every way to that prepared from the freshly precipitated oxide. With regard to

Ointment of Zinc Oxide, Mr. Edel observes that everything depends on the kind of zinc oxide used. On a large scale, with a mill, it is quite possible to grind the commercial zinc oxide to a smooth paste with the fat, and to make a satisfactory ointment. But on a small scale the oxide should be that obtained by the wet process. This is an impalpable powder which can be readily and satisfactorily incorporated in a small way on a pill tile, or in larger quantities with warm benzoinated lard in a mortar.—Amer. Drugg., Nov. 25, 1901, 311.

Tar Ointment—Use of Soap as a Basis.—W. Lyon suggests the use of a mixture of soft and hard soaps in suitable proportions as a useful substitute for the fats in making tar ointment. Thus, soft soap, 1 part; hard soap, 1 part; tar, 2 parts; gives an ointment which during the winter season would be considered of suitable consistence, but at midsummer would be held as being much too soft. In constructing a basis it has, therefore, been made an essential point that the consistence of it could be varied at will without affecting the percentage of the active ingredient. After many experiments with various soaps, it was found that the B. P. hard and soft soaps were as good as any. The following were selected as being the most suitable for summer and winter temperatures:

	Summer.	Winter.
Soft soap, B. P.....	1 part.	1 part.
Hard soap, B. P.....	2 parts.	1 part.
Tar.....	3 parts.	2 parts.

In making this ointment it is necessary that only recently-prepared hard soap should be used. If the hard soap has become dry and brittle, it is a matter of great difficulty to get a smooth ointment. The hard soap is cut in fine shreds and mixed with the other ingredients in a mortar, which is placed on a water-bath until solution is brought about; frequent stirring expedites the process.—Pharm. Journ., July 21, 1901, 61.

Useful Salves—Reliable Formulas.—B. S. Cooban recommends the following formulas for salves, which have proven very acceptable to his customers for the purposes indicated by their names:

Corn Salve: Salicylic acid, 2 ozs.; ammonium chloride, 2 ozs.; acetic acid, $\frac{1}{2}$ oz.; lanolin, 2 ozs.; white wax, 2 ozs.; lard enough to make 1 pound.

Carbolic Salve: Carbolic acid, 210 grains; camphor, 1 oz.; paraffin, $1\frac{1}{2}$; petrolatum, 16 ozs.; oil of sassafras, 30 minims.

Creme Marquise (Modified Cold Cream): White wax, $\frac{1}{4}$ oz.; spermaceti, $2\frac{1}{2}$ ozs.; oil of sweet almonds, $2\frac{1}{2}$ ozs. Melt, remove from the fire and add: Rose water, $1\frac{1}{2}$ ozs. Beat until creamy—not until cold. When the cream begins to thicken add a few drops of oil of rose.—Bull. Pharm., April, 1902, 159 and 160.

Orange Flower Skin Food—Reliable Formula for Massage Treatment of Wrinkles.—B. S. Cooban recommends the following formula for a "skin food," which he has supplied with great satisfaction for the massage treatment of wrinkles: White wax, $\frac{1}{2}$ oz.; spermaceti, $\frac{1}{2}$ oz.; cocoanut oil, 1 oz.; lanolin, 1 oz.; oil of sweet almonds, 2 ozs. Melt together in a porcelain dish, remove from the fire, add one ounce of orange flower water and three drops of tincture of benzoin, and beat briskly until creamy.—Bull. Pharm., April, 1902, 159.

Lard—Satisfactory Commercial Quality.—In response to a "query," Frederick T. Gordon has investigated the quality of commercial lard from different sources, and does not hesitate to affirm that the lard supplied by reputable firms responds in every particular to the official requirements. Pure lard, anhydrous, smooth, white and sweet, either benzoinated or not, is readily obtainable, and far better than can conveniently be prepared by the pharmacist on a small scale.—Proc. Pa. Pharm. Assoc., 1901, 126.

Sterilized Lanolin—Preparation.—Dr. Homeyer describes the following method of sterilizing lanolin: 50 kgm. of lanolin are mixed with 500 Gm. of pure hydrogen dioxide in form of a concentrated carefully neutralized aqueous solution, the mixture being effected in a jacketed kettle provided with a good mechanical stirrer. Heat is then applied and maintained at

50° C. during twelve hours under continuous stirring, when the contents of the kettle are allowed to cool, and the water withdrawn from beneath by means of a faucet provided. This treatment renders the lanolin absolutely sterile, all bacterial life being completely destroyed by the action of the nascent oxygen resulting from the decomposition of the hydrogen dioxide during the process. It is necessary now only to maintain its sterility. To this end, a second 250 Gm. of pure hydrogen dioxide, neutral and in concentrated aqueous solution, are added to the contents of the kettle, together with 5 Gm. of platinum black, and the stirring is resumed for several hours. The presence of the minutely divided platinum black causes a continuous but very slow evolution of nascent oxygen, at the ordinary temperature, and this maintains the sterility of the preparation for an indefinite period. Lanolin sterilized in this way has been introduced under the name of

"Dermozon." The presence of the small quantity of platinum black (5 Gm. in 5 kgm.) is of no consequence, while the presence of ozone effectually prevents the formation and development of the bacteria introduced from external sources.—Pharm. Ztg., Jan. 15, 1902, 44.

Lanolin—Natural Sterility.—Referring to the above, and the statement of Dr. Aufrecht (not before quoted) that lanolin always contains a large number of bacteria—as many as several hundred in a single gramme—the *"Pharmaceutische Zeitung"* calls attention to investigations by A. Gottstein and of Fränkel in 1887, in the same direction, which showed the lanolin then on the market to be entirely free from bacteria, and moreover, that lanolin must be regarded as being naturally sterile and incapable of serving as a culture medium.—*Ibid.*, Jan. 25, 1902, 73.

Wool-fat—Simplified Method of Analysis.—Borntraeger recommends the following simple method for estimating in wool-fat—as well as in other fats—(1) water; (2) dirt; (3) stearic, margaric, and palmitic acid; (4) oleic acid: One Gm. of the fat is heated in a beaker at a temperature of 110° C. to constant weight. The loss is calculated as *water*. The residual fat is dissolved in 50 Cc. of hot absolute alcohol, the whole transferred to a weighed filter, carefully washing any insoluble substance onto the filter, and washing the filter thrice with hot alcohol. The filter is dried at 100° C. and the increase in weight calculated as *dirt*. The alcoholic solution and washings are concentrated to 50 Cc. and allowed to stand in the cold for 24 hours. The solid acids are deposited, the alcohol retains the oleic acid; it is decanted, the residual acids are washed thrice with cold alcohol, dried at 100° C., weighed and calculated as *stearic, margaric and palmitic acid*. The solution and washings evaporated and dried at 100° C. give the *oleic acid*.—Pharm. Centralh., July 18, 1901, 438; from Ztschr. Anal. Chem.

Adeps Lanae Hydrosus—Method of Determining the Mixture.—Lyman

F. Kebler finds the present method for determining the mixture in *adeps lanæ hydrosus* to be very defective. On mixing 10 Gm. of the wool fat with 50 Cc. of water and warming, the fatty portion melts and, being lighter than water, rises to the top, where it forms a layer which effectually prevents the dissipation of the water. The fat should be incorporated with some solid material like finely broken glass or pure sand and evaporated on the water bath to constant weight.—*Amer. Drugg.*, Mar. 24, 1902, 161.

Vasolimentum—Improved Formula.—J. Mindes, in response to the frequently expressed wish for an improved formula for iod-vasolimentum, has made a series of experiments which enable him to recommend the formulas given below for a plain vasolimentum which is in all respects more satisfactory than that directed by Bedall for preparing the iod-vasoliment. The latter is thick-liquid, and incapable of dissolving all the iodine if a 10 per cent. preparation is desired. The vasoliments proposed by Mindes, are thin fluid, penetrate the cuticle readily, and dissolve the required percentage of iodine.

1. Liquid paraffin, 36 ; white olein, 35 ; spirit of ammonia (10 per cent.), 35 ; conc. spirit of wine, 5 parts.

2. Liquid paraffin, 35 ; white olein, 35 ; spirit of ammonia (10 per cent.), 20 ; conc. spirit of wine, 8 ; ether, 2 parts.

3. Liquid paraffin, 35 ; white olein, 35 ; spirit of ammonia (10 per cent.), 30 parts.

In the preparation of these it is essential that the mixture of the ingredients is effected in the order in which they are named in the formulas. In this connection the author, however, calls attention to a new base, which is in some respects superior to vasoliment. He has named this new base

Linogen, which, like vasoliment, is of two kinds, liquid and solid.

Linogenum Liquidum is obtained by simply substituting linseed oil for liquid paraffin in formula 2 ; while

Linogenum Spissum is made by triturating together : ointment of linseed oil (3 p. oil and 2 p. paraffin), 60 ; white olein, 30 ; spirit of ammonia (10 per cent.), 10 parts. The latter forms a light yellow, soft ointment, which is capable of taking up five times its weight of water, but separates a portion of this in the cold, retaining permanently three and one-half times the weight of the anhydrous ointment. The liquid linogen readily dissolves 6 and 10 per cent. of iodine, and holds it in permanent solution. The author has not and does not intend to protect either the name or the composition of these preparations.—*Pharm. Ztg.*, April 12, 1902, 286.

VINA.

Fruit Wines—Preparation.—The preparation of wine from small fruits,

such as strawberries, currants, gooseberries, blueberries and blackberries, is interestingly discussed in "Haus, Hof, Garten." Such wines usually prove good substitutes for the strong wines of southern countries, such as Madeira, port and sherry, because they are necessarily fermented with the addition of sugar and water, in order to modify the otherwise rough taste of the wine, in consequence of which their alcoholic strength is increased very materially. They differ in this respect very decidedly from apple cider, which is prepared best from perfectly ripe, sound fruits. The conditions essential to the production of good wines from berries are in the main the same as those observed in the preparation of cider. These are, cleanliness, exposure to air as briefly as possible, fermentation in vessel filled completely to the bung, a temperature of 15° to 20° C. during the preliminary fermentation, which may with advantage be hastened by the addition of yeast; racking off from the yeast when this is ended and stowing in a cooler place for the fining fermentation. It is, of course, impracticable to adhere to one and the same formula for preparing these wines, since the fruits will vary according to locality, season, hot or cold weather prevailing during their growth, etc. The following formulas are therefore intended only to supply a basis for the proportions of juice, sugar and water, which must then be varied in accordance with the condition of the material and the experience of the manipulator.

Strawberry Wine has been satisfactorily made with 1 liter of juice, $\frac{1}{2}$ liter of water and a short $\frac{1}{2}$ kgm. of sugar.

Currant Wines are best prepared as sweet wines, but table wines may also be produced from them. For sweet wine the proportions are 1 liter of juice, $1\frac{1}{2}$ to 2 liters of water, and 1 kgm. of sugar; a light table wine is produced by using 2 liters of water and only 400 Gm. of sugar. Black currants may be advantageously added in small proportion to the red currants. When used alone they require no sugar, the juice being simply diluted with thrice its volume of water. White currants do not admit of as much water as the red currants, the latter, moreover, producing a rough wine.

Gooseberry Wine is preferably prepared as sweet wine, using 1 liter each of juice and water, and 600 to 700 Gm. of sugar. After complete fermentation it is advantageously sweetened with sugar, according to taste.

Blueberry Wine is prepared from 1 liter of juice, $\frac{1}{2}$ to $\frac{3}{4}$ liter of water, and 270 to 305 Gm. sugar. The fermentation of this juice is very sluggish, but may be accelerated, according to Prof. Kulisch, by the addition of 0.3 Gm. of salammoniac to the liter.

Blackberry Wine is best prepared with the addition of red currants (presumably by the same general formula? Rep.).—Pharm. Ztg., Aug. 21, 1901, 667.

Huckleberry Wine—A Natural Ferro-Manganese Preparation.—Dr. E.

ermayer calls attention to the fact that a wine prepared by fermentation from the juice of huckleberries with the addition of sufficient sugar, of nothing else, to produce a product containing 8 to 10 per cent. alcohol, contains a relatively large percentage of both iron and manganese in natural combination. The wine is in every way a satisfactory product, resembling a good Burgundy wine in taste and composition, and contains from 0.35 to 0.46 per cent. of iron and manganese.—Pharm. Ztg., April 23, 1902, 316.

Cider—Process of Manufacture in Normandy.—Consul General Hertel reports interestingly on the manufacture of cider in Normandy. The numerous varieties of apples suitable for cider are divided into three classes: (1) Those ripening in August and not later than the middle of September; (2) those which attain maturity in October, but complete final stage of ripeness in the barn towards the middle of November; (3) those removed from the trees in November, before maturing and before the frosts, and only attaining ripeness in the barn after a period varying from December to February. It is said that "table apples" must be absolutely excluded, as they do not contain the necessary elements for making good cider. The best apples are those mentioned under class 2. The perfectly matured fruit is pulped in a hand mill, the pulp exposed to air in uncovered vats for about 15 hours with occasional stirring with wooden shovels, and then put into the press. The juice so obtained produces the real cider that is subsequently bottled and placed on the market; the residual pulp is returned to the vats, where it is macerated with about one-fifth its bulk of water for 15 hours or more, and again expressed, this finishing after fermentation the cider used locally throughout Normandy as a drink. The most delicate and troublesome process in the production of cider is stated to be that of fermentation. The vaults in which the juice of the apples, or "must," is fermented should have a constant temperature of 59° F., and the most perfect cleanliness must be observed. No bad odors, no fermentable substance, and no person who is not in good health should be allowed to enter, and all movements must be avoided as far as possible. Sometimes the fermentation is conducted in barrels or casks, but this does not answer so well as tubs, the easy access of oxygen being essential, and the liquid in the vats obtaining more air. In case of any great difficulty in fermentation a small quantity of old cider, sugar, or alcohol may be added, but such addition should if possible be avoided. As soon as the tub or barrel when sounded ceases to give an indication of slightest ebullition, the fermentation is completed. The liquid is now drawn off, having a layer of grosser lees at the bottom of the vat and a layer of finer lees on the surface. These two layers are most harmful to the preservation of the cider, hence the necessity of great care to draw off the clear cider between, so that no portion of these may contaminate the withdrawn. The clear cider, drawn into perfectly cleansed casks

which have been fumigated with sulphur, now undergoes a second fermentation, which gives no sound and is less energetic than the first. Here a muddy deposit also forms, necessitating a second, and usually final, drawing off of the clear product. Occasionally, however, in spite of all care, the cider fails to become clear. In this event it is clarified best by means of catechu, using 2 lbs., dissolved in 10 gallons of water, to 352 gallons of cider.—Pharm. Journ., Aug. 10, 1902, 234.

MISCELLANEOUS FORMULAS.

Sterilized Catgut—Preparation, Causes of Brittleness, etc.—Several papers on the preparation of sterilized catgut have been communicated to the Brit. Med. Jour. In the number of Nov. 16, 1901, C. A. Ball states that he sterilizes catgut by winding it firmly and evenly on a glass or lignum vitæ reel in a single layer, then placing the reel in a 5 per cent. solution of formalin and leaving it for twenty-four hours, after which it is removed and thoroughly washed in cold water. It is next dropped into boiling water and allowed to boil for five to ten minutes, according to the thickness of the gut, and finally stored in a solution prepared by dissolving mercuric chloride, 1, in boiled glycerin, 250, and methylated spirit, 1000. The glycerin and spirit dehydrate the gut, while the former renders it pliable. The mercuric chloride impregnates the gut, previously swollen by boiling it with the formalin, at the same time hardening it sufficiently to prevent it twisting when moistened by the tissues during the process of stitching. Catgut prepared in this way is sterile, keeps well, and is said to be undiminished in strength; it is also pliable, knots nicely, and is absorbable. In the number of December 21, 1901, C. T. Pearson points out that the object of using formalin is simply to enable the catgut to bear subsequent boiling in water and not to sterilize it, and he states that brittleness of catgut treated with formalin may be due to imperfect washing after treatment, or to the use of a formalin solution stronger than 4 per cent. To this C. A. Ball makes a rejoinder in the number of January 4, 1902, in which he states that raw gut sometimes contains strands which are so brittle that they are unfitted for any form of preparation. Moreover, he adds, washing after soaking in formalin is only of use to get rid of dirt; it cannot affect the brittleness, as the subsequent boiling must dissipate all traces of formalin. If the gut be thoroughly sound and strong, any subsequent brittleness must be due to the use of a stronger solution of formalin than 5 per cent., or leaving it in the solution for more than twenty-four hours, or using too strong alcohol and too little glycerin for storing.—Pharm. Journ., Jan. 25, 1902, 61.

Tooth Powders and Washes—Formulas.—Frank B. Styles discusses the value as merchandise of a good tooth powder and tooth washes to supply the popular demand for such preparations in competition with the numerous manufactured articles.

Precipitated chalk, English	8 pounds.
Orris root, powdered	1 pound.
Confectioner's sugar	$\frac{1}{2}$ pound.
Castile soap, powdered	$\frac{1}{4}$ pound.
Sodium bicarbonate	$\frac{1}{4}$ pound.
Oil of wintergreen	2 drachms.
Oil of peppermint	1 drachm.
Cochineal color, N. F.	1 ounce.

Tooth Washes that give good satisfaction are easily made. A very simple one can be prepared as follows :

Castile soap, powdered	50 Gm.
Camphor.	5 Gm.
Oil of rosemary	1 Cc.
Alcohol	250 Cc.
Water, enough to make	1000 Cc.

Another good formula is the following :

Castile soap, powdered	1 ounce.
Orris root, powdered	4 drachms.
Oil of wintergreen	$\frac{1}{2}$ drachm.
Oil of peppermint	$\frac{1}{2}$ drachm.
Oil of lemon	1 drachm.
Glycerin	1 ounce,
Alcohol	16 ounces.
Cochineal	1 drachm.

Macerate two days and filter.

Soap bark	4 ounces.
Benzoic acid	120 grains.
Oil of eucalyptus	12 minima.
Oil of wintergreen	9 minima.
Thymol	15 grains.
Glycerin	1 ounce.
Alcohol	16 ounces.
Water, enough to make	32 ounces.

Macerate seven days and filter. An

Antiseptic and Deodorant Tooth Wash may be made by the following formula :

Oil of eucalyptus	12 minima.
Oil of gaultheria	9 minima.
Thymol	15 grains.
Menthol	$2\frac{1}{2}$ grains.
Boric acid	350 grains.
Fl. ext. of baptisia	40 minima.
Alcohol	8 ounces.
Water, enough to make	32 ounces.

The author makes suggestions concerning the mode of dispensing these preparations, and gives some general advice in regard to their popularization which must be consulted in the original.—Bull. Pharm., Feb., 1902, 53-54.

Tooth Wash—Reliable Formula.—B. S. Cooban finds the following a reliable formula for a tooth wash, provided the oils are fresh and the exact quantities specified are used: White castile soap, 1 oz.; cologne spirit, 6 ozs.; water, 6 ozs.; glycerin, 2 ozs.; oil of peppermint, 20 minims; oil of cloves, 10 minims; oil of cinnamon, 20 minims; oil of wintergreen, 30 minims; extract of vanilla, $\frac{1}{2}$ oz. The soap is dissolved in the water, the extract of vanilla added, then the oils previously dissolved in the cologne spirit. After filtering, the fluid is colored red.—Bull. Pharm., April, 1902, 160.

Tooth Paste—How to Prepare.—Having tried many formulas and methods of preparing tooth paste, and after many failures succeeding to prepare a satisfactory article, I. M. Perry communicates his formula and gives the details of the process, as follows:

Take of:

Water.	4 oz.
Gelatin	120 gr.
Glycerin.	7 oz.

Dissolve the gelatin in the water by the aid of heat, then add the glycerin. Label: Massing Fluid.

Then prepare the following powder:

Precipitated chalk.....	15 $\frac{1}{2}$ av.oz.
Castile soap powder	$\frac{1}{2}$ av.oz.
Oil gaultheria.....	1 dr.
Solution of carmine, N. F., enough, or.....	1 dr.

Mix and pass through a No. 80 sieve. Put the powder into good sized mortar and pour on 4 ounces of the massing fluid. Take your pestle and commence rubbing. If you have never made a tooth paste you will doubt that 4 fluid ounces of liquid will be sufficient to make so much material into a paste. Keep your patience and keep your pestle a-going, and by and by the powder will show a moist place, which will grow larger until you have the whole thing to a paste. The rubbing should be kept up until a soft uniform mass is obtained. It is now just right for jars. For tubes add 1 fluidounce more of massing fluid, rubbing this addition into the mass well and good. Do not fill your tubes more than three-fourths full; if you do it will squeeze out all over your tube and pliers.—West. Drugg., Dec., 1901, 659.

Tooth Pastes—Formulas and Suggestions.—Frank B. Styles observes that to prepare a good tooth paste or cream is not as easy as preparing a

good tooth powder. To obtain just the right consistency is a question of experiment. If the paste is too hard it cannot be pressed into nor out of a collapsible tube in a satisfactory manner ; and if too soft, it again gives poor satisfaction. It is, therefore, quite necessary to experiment a little before going too heavy into making tooth pastes. A very good formula, and one that is not expensive to prepare, is as follows :

Precipitated chalk, English	16 ounces.
Orris root, powdered.....	4 ounces.
Castile soap, powdered	4 ounces.
Oil of peppermint	1 drachm.
Oil of wintergreen	1 drachm.
Solution of carmine, q. s., to color.	
Glycerin,	
Water, of each, a sufficient quantity.	

This must be made a paste by adding glycerin and water, equal parts. Add the solution of carmine to the chalk, and triturate or sift till the right shade is produced ; then add the powdered orris root, oils, and soap. Beat all thoroughly together.

Another very good tooth paste may be made by the following formula :

Precipitated chalk, English	16 ounces.
Orris root, powdered.....	5 ounces.
Cinnamon, powdered	1 ounce.
Cloves, powdered	4 drachms.
Tincture of quillaja.....	2 fl. ounces.
Honey, a sufficient quantity to make a paste.	

—Pharm. Era, Feb. 20, 1902, 193.

Tooth-Ache Cure—Reliable Formula.—B. S. Cooban states that the following formula for a tooth-ache cure gives good satisfaction : Chloral hydrate, 1 oz. av. ; camphor, 1 oz. av. ; chloroform, 1 fl. oz. ; ether, 1 fl. oz. ; oil of cloves, 2 fl. ozs. ; oil of peppermint, 2 fl. ozs. ; alcohol, enough to make 16 fl. ozs.—Bull. Pharm., April, 1902, 160.

Tooth-Ache Remedy—Original Formula :—

Chloral hydrate.....	1 drachm.
Water	4 drachms.
Tincture of aconite.....	15 drops.
Chloroform	20 drops.
Ether	20 drops.
Alcohol	20 drops.
Acetous tincture of opium.....	2 ounces.
Oil cloves.....	2 ounces.
Camphor	90 grains.

—Amer. Drugg., Dec. 23, 1901, 377.

Cosmetic Jelly for the Hands—Reliable Formula.—B. S. Cooban recom-

mends the following formula for a cosmetic jelly, to be rubbed on the hands after bathing until dry: Macerate 60 grains of tragacanth (in white ribbons) in 14 ozs. of rose water for two days, strain forcibly through muslin, add 1 oz. each of glycerin and alcohol, and perfume to suit.—Bull. Pharm., April, 1902, 159.

Jaborandi and Bay Rum Hair Tonic—Original Formula.—The following formula for a hair tonic is given in "Amer. Druggist" (Dec. 23, 1901, 377):

Quinine sulphate.....	65 grains.
Tincture of capsicum	5 drachms.
Tincture of cantharides	4 drachms.
Fluid extract of jaborandi	2 drachms.
Distilled extract of witch hazel.....	6 ozs.
Sodium chloride	2 drachms.
Alcohol	12 ozs.
Oil of rose geranium, enough to perfume.	
Water, enough to make.....	2 pints.
Red saunders, enough to color.	

A Good Tonic—Formula for Counter Dispensing.—B. S. Cooban recommends the following formula for preparing "a good tonic" for the daily inquiries at the dispensing counter, which has been supplied by him with satisfaction:

Quinine sulphate.....	72 grains.
Quinidine sulphate	80 grains.
Cinchonine sulphate	12 grains.
Strychnine sulphate.....	8 grains.
Pyrophosphate of iron	2 ounces.
Water	4 ounces.
Simple elixir, enough to make.....	1 gallon.

Dissolve the alkaloids in a portion of the elixir; dissolve the iron and strychnine in the water; then mix both solutions and add enough elixir to make one gallon.—Bull. Pharm., Jan., 1902, 14.

Southern Ague Remedy—Original Remedy.—A writer in "Amer. Druggist" (Dec. 23, 1901, 377), gives the following formula for an "ague remedy," which has received honorable mention:

Tincture of eucalyptus	2 ozs.
Tincture of serpentaria	4 ozs.
Tincture of capsicum	5 drachms.
Tincture of myrrh	5 drachms.
Tincture of nux vomica.....	2 drachms.
Quinine sulphate.....	60 grains.
Elixir of glycyrrhiza, q. s.....	16 ozs.
M. Put up in 4 ounce bottles.	

Cherry-Pine Cough Cure—Original Formula.—A writer in "Amer.

White pine bark.....	1 ounce.
Wild cherry bark	1 ounce.
Balm Gilcad buds.....	1 drachm.
Sanguinaria	1 drachm.
Sassafras	1 drachm.
Chloroform	1 drachm.
Alcohol.....	4 ounces.
Water	4 ounces.
Syrup	8 ounces.

Reduce the drugs to a coarse powder and percolate with alcohol and water in equal portions until 8 ounces are obtained, then add the syrup and chloroform.

Lightning Renovator—Reliable Formula.—B. S. Cooban gives the following formula for a cleansing fluid for removing stains from woolens, cloth, carpets, &c., which has proven reliable: Stronger ammonia water, 1 oz.; tincture of green soap, 3 ozs.; sodium carbonate, sodium borate, each, 2 drachms; ether, 1 oz.; alcohol, 1 oz.; water, enough to make 2 pints.—Bull. Pharm., April, 1902, 160.

Furniture Polish—Reliable Formula.—B. S. Cooban recommends the following formula for a good furniture polish: Linseed oil, 20 ozs.; spirit of turpentine, 12 ozs.; solution of antimony chloride, 1 oz.; vinegar, 8 ozs.; wood alcohol, 3 ozs.; camphor, $\frac{1}{4}$ oz.; ammonium chloride, 3 drachms. Dissolve the camphor in the spirits, the ammonium chloride in the vinegar, and mix the other ingredients with these in the order given. Shake for some time to secure a smooth, creamy mixture.—Bull. Pharm., April, 1902, 159.

Shoe Polish—Preparation Without Acid.—According to "Seifenfabrikant" (1901, 116), a shoe polish, free from acid, may be prepared as follows: Bone black, 1.5 kgm., and lampblack, 9 to 12 kgm., are heated and stirred together in a kettle with syrup, 30 to 33 kgm., until a homogeneous mass is formed. In a second kettle, shredded gutta percha, 1.5 kgm. is heated gently over an open fire to melting, then olive oil, 2.5 kgm., is gradually added under constant stirring until complete solution is effected, and lastly, 500 Gm. of stearin. The warm solution so obtained is then stirred into the mass of lampblack, syrup, etc., and when a homogeneous mixture results a solution of gum senegal, 2 kgm., in water, 6 kgm., is incorporated, the resultant polish being finished by perfuming it with 100 Gm. of oil of mirbane or oil of lavender.—Pharm. Centralh., Dec. 12, 1901, 798.

C. NEW REMEDIES

AND TRADE-NAMED SPECIALTIES.

Acopyrin is the trade-name given to the acetylsalicylate of phenyldimethylpyrazolin. It forms a white, crystalline powder, melting at 63°–64° C., is easily soluble in alcohol and chloroform, sparingly in ether, requires 400 parts of cold water, but is soluble in 30 parts of hot water. Acopyrin is recommended as an antipyretic, and is used in acute articular rheumatism in doses of 0.5 Gm., or even larger doses (1 Gm.). It is also recommended as an analgetic in headache, sciatica, etc.—Pharm. Ztg., xlv, No. 31, 1901.

Acurine—A Substitute and Analogue of Diuretin.—Impene has prepared and introduced a compound of sodium acetate and sodium-theobromine, analogous to diuretin (sodio-theobromine salicylate), which is favorably reported on by Destrée. It is said to be more powerful as a diuretic than diuretin, and being less caustic, is more easily tolerated. It is active in relatively small doses of 4 to 8 grains per diem, and its effects are evident for some days after treatment.—Pharm. Journ., Aug. 24, 1901, 273; from Bull. Gén. de Thérap., 131, 913.

Agurin is the name given by Destrée to a compound of theobromine-sodium and sodium acetate, and recommended by him as being an excellent diuretic in relatively small doses, and tolerated well by the stomach. It is a white, hygroscopic powder, readily soluble in water, and has a strong alkaline reaction.—Bull. gén. de Thérap., 1901, 913.

Aleuronat-New has been introduced to replace the "aleuronat" hitherto employed. It is a by-product of starch manufacture from wheat and the result of the separation of the gluten and starch of the grain by mechanical means with the aid of water alone. According to the analysis of M. Wintgen it contains 87 per cent. of protein, 6 per cent. of ether-soluble extract, 6.5 per cent. starch, 0.28 per cent. cellulose, and 1.27 per cent. mineral matter.—Phar. Ztg., May 17, 1902, 388; from Ztschr. f. Unters. d. Nahr., 1902, No. 7.

Amylarin is the name given by C. Jacoby to "isoamyltrimethylammonium chloride," which seems to possess some advantages over tetramethylammonium triiodide, with which Rosenbach has recently obtained good clinical results as a substitute for iodoform in the treatment of wounds. Jacoby finds that the last-named compound combines the physiological action of curare and muscarin, and that it is toxic even in moderate doses, while in the case of "amylarin," the muscarin effect is not so pronounced.—Pharm. Centralh., June 19, 1902, 325.

Anæsthesin.—The ethyl ester of *p*-amido benzoic acid, which was first prepared by E. Ritsert in 1890, is now supplied under the name of anæsthesin, and is recommended by C. v. Noorden both as a local

anæsthetic in the form of suppositories, bougies and salves for bladder affections, pruritus, &c., and internally in hypodermic stomach in doses of 0.3 to 0.5, and for coughs in form of lozenges containing 0.02 to 0.04 Gm. It is a white, tasteless and odorless substance producing a benumbing sensation on the tongue soon after its use. It is sparingly soluble in cold water, somewhat more soluble in warm water, and readily soluble in alcohol, ether, chloroform, acetone and benzene—the latter properly facilitating its exhibition in form of suppositories.—Pharm. Ztg., May, 7, 1902, 356; from Berl. Klin Wschr.

Anæsthesin Solubile has since been successfully produced from which solutions are readily prepared which have proved that Dr. Dunbar recommends them as substitutes for cocaine as local anæsthetics. Its use is not attended by irritant effects.—Pharm. Ztg., June 11, 1902, 460.

Antiarthrin is the name given to a condensation product of tannic acid and salicylic acid which is prepared as follows: One part of tannic acid with 20 parts of 5 per cent. hydrochloric acid at a temperature of 60° C. until the hydrolyzation of the tannin is completed; then 10 parts of salicin (or the corresponding quantity of saligenin) are added and heating at 90° C. is continued on the water-bath for about 2 to 3 half hours. The clear solution at first produced then becomes a cinnamon-brown, resin-like body—the condensation product of tannic acid and saligenin—is deposited, while the glucose present splits up of the tannin and the excess of salicin is retained in solution. The antiarthrin, obtained after washing, is about 70 per cent. of the tannin employed.—Pharm. Ztg., 1902, 666.

Antidiphtherin, as prepared in Prof. Wittstein's chemical laboratory (Munich), contains as essential ingredients the resin acid, salicylic acid, menthol and phenol. It is a dry powder, which may be used in form of fumigation. While the fumes are not inconvenient in suffering with diphtheria, they are quite irritating to the eyes in a circumstance which to some extent militates against its use.—Pharm. Ztg., April 26, 1902, 327.

Antimorphin, a specialty introduced by a Berlin firm for the treatment of morphine habit, is stated to be a preparation composed of Jamaica dogwood, Paraguay roux, mandragora, quinine, water and wine. According to Lewin the components of this preparation are not of a character to give the relief claimed.—Pharm. Ztg., 1902, 460.

Apallagin is the mercuric salt of nosophen (tetraphenol) which is recommended as an antiseptic.—Pharm. Ztg., Aug. 21, 1902, 460.

Aristochinin is the name given to the "diquinine-carb

atively tasteless compound, but easily absorbed and developing the therapeutic action of quinine promptly without producing any gastric disturbances.—D. Aerztl. Ztg., 1902, No. 5.

Arrhénal is the name given by A. Gautier to a "methyl-arsenite of sodium," having the formate of $\text{OAs.CH}_3\text{O}_2\text{Na} \cdot 2\text{H}_2\text{O}$, obtained by the act on of methyl-iodide on sodium arsenite in presence of excess of alkali. It forms a well-crystallized, colorless salt, readily soluble in water, difficultly in alcohol, of alkaline reaction and taste, non-hygroscopic, and slightly efflorescent. It contains 34 per cent. of arsenic, corresponding to 45 per cent. of arsenous acid, but is comparatively non-toxic, so that it may be given with impunity in doses up to 0.2 Gm., beginning with 0.025–0.1 Gm. daily. It is claimed to be more acceptable to the stomach. It is apparently identical with the so-called "Neo-Arsycodile," which see below.—Phar. Ztg., Mar. 19, 1902, 220; from *Nouv. Remèdes*, 1902, No. 5.

Arsenic-Salicyl-Cannabis-Plastermull is made, after Unna, so that 1 meter shall contain 5 Gm. each of arsenous acid and extract of cannabis, and 20 Gm. of salicylic acid.—Derm. Monatsh, 32, 293.

Arsitriol is the name given by Schlagdenhauffen and Pagel to "calcium glycono-arsenicum," which see under "Alcohols."

Arvenol is the name given to a remedy for nasal catarrh, composed of menthol, thymol and camphor, dissolved in ether. It is used by pouring 20 drops on cotton in a small inhaler and, after the evaporation of the ether, inhaling it through the nostrils.—Pharm. Ztg., April 2, 1902, 262.

Atarsyle is the name given to "ferric cacodylate." It is recommended in doses of 0.01 Gm. in anæmia, neurasthenia and skin diseases.—Pharm. Post., Feb. 23, 1902.

Atoxyl is the name given to a new arsenic preparation, originating in Charlottenburg (Berlin), which is claimed to be nearly non-toxic. It is recommended for subcutaneous medication in doses of 0.05 to 0.2 Gm. It is described to be the anilid of met-arsenic acid, and constitutes a white, crystalline, odorless and tasteless powder, which is readily soluble in water, and does not part with arsenic except under the influence of very energetic agents.—Pharm. Ztg., March 1 and 15, 1902, 170 and 211.

Bacillol is a new antiseptic compound which, according to T. Werner, is perfect in its efficiency. It has a slight creosote-like odor, is easily soluble in water, and is used in 1 per cent. solution.—Amer. Drugg., Dec. 23, 1901.

Bertolin is a Berlin specialty which is said to be essentially a fluid extract of the root of *Nicotiana Bertolonii* (?) to which tannin and several other ingredients are added. It is recommended as a remedy in gout, rheumatism, malaria, &c., and is said not to contain either salicylic acid

colchicine, or toxic ingredients of any kind. — *Phar* 1902, 74.

Boliformin is the name given by Hirschfeld to a ve and dusting powder which is claimed to possess excellent disinfectant properties. It is a grayish-white powder, h of formaldehyde, and is said to be a condensation pro with certain aluminates—principally silica-aluminate.—*J. Ap. Ver.*, 1901, No. 32.

Braunolin is the name given to a vulnerary, manufa which is said to be composed of tincture of arnica, e spermaceti, tallow, wax and oil.—*Pharm. Centralh.*, Jan.

Bromofarina is a Berlin specialty and consists of a fa meal containing certain quantities of bromine salts, intenc baking of the so-called “bromopan” (= bromine brea Feb. 26, 1902, 158.

Calminum is the name given to tablets composed o heroin, recommended as a remedy for whooping coug Oct. 19, 1901, 837.

Cocloin is the name given to an Italian food produ “vegetable milk,” which is said to be an aqueous extra green maize, having the appearance of milk.—*Pharm. Zt* 262 ; from L'Orosi.

Corpulin, an anti-fat remedy, contains according to extract of bladder-wrack (*Fucus vericulosus*), tamarin sagrada.—*D. Med. Wschr.*, 1901, No. 29.

Crtosocamphre is a French specialty composed of eq creosot and camphor, and forming an oily fluid, soluble : hol and ether, but insoluble in water. It is administered quieting the nerves in oily solution or in capsules, the a 0.5 to 1 Gm.—*Pharm. Ztg.*, May 31, 1902, 428 ; from 1 1902, No. 5.

Derival is the name given to a Berlin specialty comp mustard, ammonia, and oil of turpentine and recommend ment of rheumatism.—*Ph. Ztg.*, Dec. 14, 1901, 992.

Dermozon is the name given to a lanolin preparation cc (hydrogen dioxide?).

Elkossan is the name given to a powerful antidysenteric specialty, in the form of tablets, which, according to Maug from *Brucea sumatrans*. It is administered in daily doses —*Pharm. Ztg.*, May 7, 1902, 356.

Embryonin is the name given to a specialty compose wheat germs. It is recmmended by Barré in tuberculosi of 30 to 35 Gm.—*Pharm. Ztg.*, May 7, 1902, 356.

posed of the proteids of rice, which is obtained by treating the rice with alkalis and neutralizing the dissolved proteids with an acid, etc. It is supplied in form of a fine, nearly odorless and tasteless powder, of a greyish white color, sparingly soluble in water, but swelling on immersion. According to Wintgen it contains 92 per cent. of protein, and only 0.74 per cent. of starch. It yields 5 per cent. of ether extract and 1.13 per cent. of ash. It constitutes an easily digestible food, replacing meat.—Ztschr. f. Unters d. Nahrungsm. 1902, No. 7.

Epiosin is the name given by E. Vahlen to a derivative of morphine obtained in the course of his studies and investigations of the constitution of morphine. This substance possesses marked anodyne properties and may be given to adults in doses of 0.1 to 0.13 Gm. Its composition corresponds to the empirical formula $C_{18}H_{17}N_7$. It crystallizes from alcohol in colorless transparent prisms, which melt at $195^{\circ}C.$; is readily soluble in alcohol and chloroform, but insoluble in water and in ether, forming, however, salts with the acids which are readily soluble in water.—Pharm. Ztg., May 21, 1902, 399.

Ethylol is a trade name for chemically pure ethyl chloride, marketed as a local anæsthetic.—Pharm. Ztg., Oct. 19, 1901, 837.

Eubiose is the name given to a concentrated form of hæmatogen, free from glycerin, and rendered stable by treatment with carbonic acid.—Pharm. Ztg., Oct. 30, 1901, 869.

Eucaine Acetate—Advantages over the Hydrochloride.—P. Cohn finds that eucaine acetate is preferable to the hydrochloride for preparing anæsthetic solutions for the treatment of the eye, because of its greater solubility. He employs it in form of 2 per cent. aqueous solution, of which 4 to 5 drops are sufficient to produce complete anæsthesia in three minutes and retaining it during 10–15 minutes. The solution may be subjected to repeated boiling without injury.—Therap. Monath., 1901, No. 11.

Eunatroleum is the trade name which is given to a pure sodium oleate intended for internal exhibition in doses of 2 grammes daily as a substitute for olive oil in the treatment of cholelithiasis.—Gehe's Bericht, Spring, 1902.

Fergon is the name of an organic iron specialty resembling the albuminate, for which it is claimed that it is completely free from alkali or acid, and that it is sterile, stable, and uniform in composition.—Pharm. Ztg., April 19, 1902, 306.

Forman is the name given by Lingner to a compound described by E. Wedekind as being "chlormethylmenthyl ether," which in contact with moist air or, more rapidly, with warm water, decomposes into its origina

constituents, methyl and formaldehyde, splitting off hydrochloric acid at the same time. The menthol and formaldehyde are given off in the gaseous form. Forman is recommended for inhalations and insufflations in the treatment of catarrhal affections. In severe cases of nasal catarrh, it is insufflated after dilution with paraffin oil or oil of sweet almond. In mild cases cotton impregnated with the remedy is introduced into the nostrils.—Pharm. Ztg., July 6, 1901, 542.

Formazol is the name given to a specialty supplied by a Swiss manufacturing firm to replace a similar but more powerful preparation which had been previously introduced by the same firm under the name of "igazol." Formazol is also cheaper. It is stated to contain about 30 per cent. of paraformaldehyde, together with small quantities of iodoform, chloral hydrate, terpin and menthol, and is used as a fumigatory, the vapors being developed by the aid of a specially constructed apparatus. These vapors, pervading the room, are inhaled by patients suffering with pulmonary consumption.—Pharm. Centralh., July 25, 1901, 458.

Gabianol is the name given to a greenish-fluorescent, dark brown, oily fluid, said to be prepared from the natural slade of Herat, which is recommended as a remedy in all forms of throat and pulmonary catarrhs. It is given in doses of 0.25 Gm., dispensed in capsules, four to six times daily.—Pharm. Centralh., June 26, 1902, 334.

Gallianin is the name given by Tichard and Cotty to a liquid remedy used in veterinary practice in pulmonary and bronchial affections. It is said to be composed of ozone dissolved in some innocuous vehicle, and is injected into the jugular vein of animals in the following doses: 5 to 20 Cc. to horses; 30 Cc. to steers; 1 to 3 Cc. to dogs.—Pharm. Ztg., Feb. 26, 1902, 159.

Gelone is the trade-name given to a new surgical dressing belonging to the class of glycero-gelatins, and is intended to replace the plasters commonly used in skin diseases, being readily combined with a variety of medicinal agents. It forms a flexible, non-irritating film, which is easily removed by water, and is highly recommended by physicians who have used it. The name of

Tegone is given by the same authority to an agar-agar mass, which is used for the same purpose.—Wien. Med. Pr., 1902, No. 7; Pharm. Post, Feb. 23, 1902.

Glutannol is the name given to a compound of tannin and vegetable fibrin, which, like tannalbin, becomes active when it reaches the intestinal tract. It is recommended in dysentery, intestinal catarrh, and the diarrhoea of children. The adult dose is from 0.25 to 1.0 Gm., but it may be given in doses of a teaspoonful without injury. For children, 0.25 to 0.5 Gm. is usually sufficient.—Pharm. Ztg., May 31, 1902, 428.

Glycomorrhum is a French specialty which has been introduced in the

hospitals of Paris by Faudon as a substitute for codliver oil. It is mainly composed of glycerophosphates and hypophosphites—but the formula is not given.—Pharm. Centralh., June 26, 1902, 334.

Glycosal is the name given to the *mono-salicylic acid glycerin-ester*, first prepared by Tæuber. It occurs as a white crystalline powder, melting at 76° C., and soluble in cold water to the amount of about 1 per cent., but exceedingly soluble in hot water, and also in alcohol, less soluble in ether and chloroform. It is recommended as possessing some advantages over other salicylic compounds as an antiseptic and antirheumatic remedy.—Pharm. Ztg., Feb. 26, 1902, 159.

Guaiacolterpin is the name given to a compound of guaiacol, terpinol and eucalyptol, and

Guaiacolterpin-chlor-ichthyol is the name given to a compound containing in addition chloroform and ammonium sulphichthyol.—Pharm. Ztg., Oct. 10, 1901, 837.

Guaiamar is the name given to the glycerin ether of guaiacol, $C_6H_5 \cdot OC_3H_7O_2 \cdot OCH_3$. It is a white crystalline powder, having a bitter taste and aromatic odor, melting at 75° C., and dissolving at ordinary temperature in alcohol, ether, glycerin, and in 20 parts of water. It is absorbed by the skin just as easily as through the alimentary tract, and in the latter it is decomposed, under the influence of the gastric and intestinal juices, into guaiacol and glycerin. It acts as an antiseptic in the treatment of typhoid fever, and has been used with success in other conditions in which guaiacol is indicated. In acute articular rheumatism an ointment of 7.8 Gm. of guaiamar with 30.0 Gm. of lanolin was used.—L'Union Pharm., Oct., 1901.

Guttacura is the name of a Berlin specialty, in form of tablets, recommended for the treatment of gout and uric acid diathesis, which is composed of kinic acid and hexamethyltetramine.—Pharm. Ztg., Dec. 14, 1901, 992.

Hæmaphoskol is the name given by C. Stephan to a combination of 0.4 Gm. detannated fluid extract of cola and 0.2 Gm. glycerophosphate of sodium in a tablespoonful of a concentrated hæmaglobin solution.—Pharm. Ztg., Dec. 14, 1901, 992.

Hæmatofer is the name given to a hæmatogen preparation which is said to contain in 100 parts, 80 parts of ferro-manganic albuminate solution, 10 parts of C. P. glycerin, 9 parts of Grecian wine, and 1 part of aromatic essence.—Pharm. Ztg., Dec. 4, 1901, 966.

Haemorrhol is the name given by Wirthgen to a hypnotic mixture, which is stated to be prepared from myrrh, centaury, eucalyptus, rose, each 1.0; lemon (rind? Rep.), 20.0; tannin, 2.0; glycerin, 20.0.—Pharm. Ztg., Jan. 22, 1902, 65.

Hermophenyl—A New Organic Mercury Compound.—Under the name of “hermophenyl,” Lumière and Chevrotier have introduced a new organic compound of mercury, which is chemically the

Sodium-Mercury-Phenol Disulphonate. It occurs in the form of a white powder which is very soluble in water, and, although containing 40 per cent. of mercury, the usual chemical reactions for that metal are completely masked, and the body possesses practically no irritant action on the mucous membrane. It is prepared by adding freshly precipitated yellow mercuric oxide to a boiling 20 per cent. solution of sodium phenol-disulphonate, evaporating the solution on the water bath, and precipitating the filtered liquid with alcohol. The precipitate is then washed with hot dilute alcohol and dried. Experiments on animals show that 5 to 40 per mille solutions may be applied to the eye without producing any reaction. A 4 per cent. solution applied to the skin gave rise to no reddening. Even when the dry powder was dusted on open wounds no irritation was produced. The toxic dose by intravenous injection for dogs and rabbits is 0.040 Gm. per kilo of body-weight, 0.125 Gm. per kilo by subcutaneous injection, and 0.20 Gm. per kilo when administered by the mouth to guinea-pigs. Hermophenyl is an active bactericide, and does not appear to derange the digestive functions when given in normal doses. Under its influence animals increase in weight, the chief excretory elements of the urine are diminished but not the volume of liquid. Solutions of 1 : 500 injected hypodermically or into the muscular tissue are rapidly absorbed, and do not give rise to abscesses nor persistent induration.—Pharm. Journ., Sept. 7, 1901, 313; from *Nouv. Rem.*, 17, 344.

Histogénol is the name given by Mouneyart to a compound of “Arrhenal” (which see) and an organic phosphorus compound, using for this purpose nucleinic acid prepared from the milt of herrings. Five parts of arrhenal (= sodium-methyl-arsenite) are mixed with 20 parts of the nucleinic acid. Histogénol so obtained is claimed to be very effective in improving the condition of persons suffering with tuberculosis.—Pharm. Ztg., April 19, 1902, 306; from *Rep. de Pharm.*, 1902, No. 4.

Hydrargotin is the trade name given by a German firm to “hydrargyrum tannicum” of their own preparation.

Ichthammon is the name given to a Prussian substitute for ichthyol, which, like the latter, is obtained from the tarry distillate of a bituminous mineral, which is converted into a sulfonic acid, and this treated with ammonia. It is said to possess all the properties—physically, chemically and therapeutically—of ichthyol.—Pharm. Ztg., April 19, 1902, 306.

Ichthosot is a compound of ichthyolammonium and creosote carbonate, which is recommended by H. Goldmann as being valuable for the treatment of pulmonary tuberculosis in its various stages. It may be given in the form of pills or mixture—the “pills” containing 0.10 Gm. of the ichthyol

and 0.04 Gm. of creosote compound. The "mixture" is effected by the aid of a little alcohol and much peppermint water.—Wien. Med. Presse, 1901, No. 29 and 30.

Iodogenol is the name given to an iodine compound of peptonized albumen, which is intended to replace the ordinary iodine preparations. It is said to have given good results in arthritis, gout, etc., and in cases in which the alkaline iodides are not acceptable.—Pharm. Ztg., Sept. 21, 1901, 759.

Iodyloform is the name given to a Berlin specialty which is recommended as a substitute for iodoform as dusting powder. It is said to consist essentially of gelatin containing 10 per cent. of iodine.—Pharm. Ztg., May 21, 1902, 400.

Jamrosin is the name given to a fluid extract prepared from an East Indian myrtaceous drug, which is recommended by a Parisian firm as of high value in the treatment of diabetes. It is administered in doses of 6 drops 3 times daily.—Pharm. Ztg., Oct. 19, 1901, 838.

Korpulin is the name given to a preparation of bladderwrack, tamarinds and cascara sagrada, which is recommended for the reduction of obesity, and claimed to have been successfully used for this purpose.—Pharm. Ztg., Nov. 9, 1901, 898.

Kosckym is the fanciful name given to a tonic malt extract prepared by a manufacturer named Koscky.—Pharm. Ztg., Feb. 26, 1902, 159.

Lactannin is the name given by the Société Chimique der Usines du Rhône to "bismuth-lacto-mono-tannate." It is supplied in the form of a yellowish powder, insoluble in water and in dilute acids, and is reputed to be a powerful intestinal antiseptic. It possesses the advantage over the tannates heretofore employed that it does not become active until it has passed through the stomach and into the intestines. The daily dose is from 1 to 2 Gm., divided and administered at suitable intervals.—Pharm. Ztg., Aug. 24, 1901, 674; from Pharm. Rdsch., 1901, No. 33.

Lecithol is the name given to an aromatic hæmoglobin preparation containing glycerophosphoric acid and iron in organic combination. The same preparation, without the glycerophosphoric acid is marketed under the name

Dynamogen.—Pharm. Ztg., Feb. 26, 1902, 159.

Leukoplast is the name given by a Hamburg firm of plaster manufacturers to an adhesive caoutchouc plaster containing zinc oxide. It is supplied and spread on fabrics of different textures.—Pharm. Centralh., Nov. 21, 1901, 734.

Levico-Oker is the name given to the mud formed by the waters of the Levico arsenical springs in the Tyrol. It contains both iron and arsenic, and is recommended in the form of hot poultices for the treatment of neuralgia, chronic inflammatory processes and exudations, and in sexual ailments.—D. Med. Ztg., 1901, No. 73.

Lipiodol and *Lipobromol* are the names given by Lafay to oily solutions of iodine and bromine respectively, which are recommended as substitutes for the corresponding alkali salts. Both preparations are colorless, or nearly so. The iodine oil contains 40 per cent. of iodine, and may be injected subcutaneously without producing pain or iodism. The bromine oil contains $33\frac{1}{3}$ per cent. of bromine, and may be used either by internal or subcutaneous administration. The method of preparing these oils is not given.—Pharm. Ztg., June 11, 1902, 460; from *Nouv. Remèdes*, 1902, No. 10.

Lygosinate of Quinine (*Chininum lygosinatum*), which was mentioned briefly under "Lygosin" in last year's report (see Proceedings 1901, 638) is now described as being a fine, orange yellow powder, almost insoluble in water, but easily dissolved by alcohol, benzin and chloroform. Its solution in boiling oil, in the proportion of 5 : 100, does not evidence any deposition after standing for a week. Its taste is bitter, its odor scarcely perceptible, but faintly aromatic. Bacteriological experiments made by J. Hevesi prove this compound to possess marked bactericidal properties, and the new compound has proven useful for the antiseptic treatment of wounds, either as dusting powder, in combination with plaster masses, or in form of a 10 per cent. glycerin mixture.—Pharm. Ztg., April 23, 1902, 317; from *Centralbl. f. Chirurgie*, 1902, No. 1.

Lysulfol is the name given by E. Rumpf to a compound of lysol and sulphur. It is perfectly soluble in water, contains 10 per cent. of sulphur, and forms a thick black fluid having nearly the consistence of ointment. It is recommended as a superior remedy in various forms of skin disease, either by itself or diluted with an equal volume of glycerin, an inunction to be applied at night and washed off in the morning, excellent results having been obtained in pityriasis versicolor, scabies, and even in chronic cases of psoriasis and prurigo.—Therap. Monath., 1901, No. 11.

Malto-gen is a dry extract of malt of Austrian manufacture which is claimed to have the advantage over other dry malt extracts in being non-hygroscopic. It is composed of 25.7 per cent. maltose, 65.71 per cent. extract and 8.59 per cent. moisture—40 per cent. of the solids being caramelized.—Pharm. Ztg., May 17, 1902, 388.

Mammalin is the name given to breast plasters introduced by a Hamburg firm of plaster makers. These plasters are spread upon an elastic, tricot-like fabric, cut into discs of 15 Cm. diameter and provided with a hole in the center. The composition of the plaster-mass is not given.—Pharm., Ztg., May 7, 1902, 356.

Marsitriol is the name given to "ferrum glycero-arsenicum," an amorphous, yellowish salt, which is insoluble in water. See "Arsitriol."

Marsyle is the name given to ferric cacodylate, which is recommended for impoverished blood, neuræsthenia, skin diseases, etc., in doses of 0.01 Gm.—Pharm. Ztg., Feb. 12, 1902, 124.

Mediglycin is the trade name for a liquid glycerin soap, to which various medicaments may be added, such as camphor, carbolic acid, creolin, ichthyol, sulphur iodide, potassium iodide, oil of cade, tar, mercury salts, etc.—Pharm. Ztg., Oct. 19, 1901, 838.

Melon is the trade-name given to a concentrated extract of *Melilotus caeruleus*, which is recommended as a cicatrisant to wounds, its application stimulating healing and the formation of scars. It occurs as a thick, greenish-black liquid, having an aromatic odor, and contains cumarin, probably in combination with melilotic acid, and an essential oil.—Centrbl. f. d. ger. Therap., Nov., 1900.

Menthoform, a substitute for "forman" (which see), is the name given by C. W. Hausmann to a mixture of a "chlormethyl-menthyl ether" with an equal part of vaselin oil.—Pharm. Ztg., April 2, 1902, 262.

Menthorol (*Menthosol*?) is according to A. Logneki a mixture of menthol and parachlor phenol, which is used for penciling the upper air passages in tuberculosis, in the form of glycerin solutions containing from 5 to 15 per cent. of the medicament.—Therap. Monatsh., 1902, No. 1.

Mercuric Iodocacodylate, as employed by Ciavette and Fraisse for subcutaneous administration in syphilis, is prepared according to the following formula: Mercuric cacodylate, 1 part, and cacodylic acid, 2 parts, are dissolved in distilled water 75 parts, and a solution of 3 parts of potassium iodide in distilled water is added, and enough distilled water added to make 100 parts. From 18 to 20 injections of from 1 to 2 Gms. (15 to 30 minims) each are made in four weeks.—Pharm. Post., Feb. 25, 1902.

Mercurivanillin is a French specialty introduced by Dr. Bourcet as a remedy in syphilis, and claimed to be of definite composition. It is a white powder, contains 40 per cent. of mercury, has the odor of vanilla, and is tasteless. Although insoluble in cold or hot water, it is soluble in dilute acids. It is prepared from yellow mercuric oxide and vanillin.—Pharm. Centralh., May 29, 1902, 299; from Nouv. Reméd., 1902, 197.

Morrhual—not to be confounded with the so-called "morrhual"—is the name given to stable emulsion of cod liver oil, introduced by Dr. R. Brüggemann, which contains 0.05 per cent. of iodine—in form of "iodipin" (see Proceedings, 1901, 636)—together with the calcium and sodium salts of phosphorous acid.—Pharm. Ztg., Feb. 26, 1902, 159.

Myclocene—*A Preparation of Bone Marrow*.—Under the name of "myclocene," Dr. Chalmers Watson uses bone marrow successfully for the treatment of deafness due to certain forms of middle ear disease. It is prepared by extracting the marrow from healthy bones by means of ether, evaporating the solvent, and adding 1 per cent. of chloretone as a preservative. Successive extractions with ether sometimes afford fatty residues of different melting points, varying from between 120° and 130° F. to between 70° and 80° F. Only the fat of the lower melting point should

be employed. It is used by instillation, ten drops of the warm myclocene being dropped into the ear at night; a small quantity being at the same time applied to the skin around the ear.—Brit. Med. Journ., 1, 699; Pharm. Journ., April 12, 1902, 293.

Mycoserum is the name given by A. Lambotte to a meat preparation—or muscle juice—prepared by him as follows: To 4.5 kilos of chopped meat he added half its weight of water, macerated for three hours, and expressed the meat. In this manner he obtained two liters of a liquid whose specific gravity was 1.010. This liquid, filtered and evaporated, leaves a dry residue of 38 grammes per liter. The ash weighs 7 grammes per liter, the coagulated albuminous substances 17 grammes per liter. If equal quantities of meat and water were taken, the residue was only 30 grammes per liter. This process by no means exhausts the meat, for on macerating the residue and again expressing, the liquid obtained gives 28 grammes of dry residue per liter, of which 6 grammes were ash. The liquid was rich in coagulable proteids. The ash of muscle-juice was rich in phosphoric acid and in calcium salts. It is better not to use a press, for the elasticity of the meat fibers prevents complete extraction in this way. The meat is simply placed upon a fine sieve over an earthenware vessel, and the juice allowed to drip off slowly. Mycoserum is recommended in tuberculosis.—Amer. Drugg., Aug. 12, 1901; from J. de Ph. d'Anvers., 1901.

Neo-Arsycodile is the name given to an arsenic compound composed of sodium methyl-arsenite, and is intended to replace the so-called “arsycodile” (see Proceedings, 1901, 627), which is simply sodium cacodylate. Neo-arsycodile is, therefore, probably identical with the previously mentioned “arrhenal,” which see above.—Pharm. Ztg., Mar. 19, 1902, 220.

Nervocidin is the name given by Dalma to a specialty prepared from an (East?) Indian plant called “gasu-bassu,” recommended as an efficient local anæsthetic. The preparation is said to be the hydrochloride of an alkaloidal constituent of the plant, which is used in the form of 0.05 to 0.1 per cent. solutions, of which 2 drops are claimed to be sufficient to produce anæsthesia of the cornea.—Pharm. Ztg., April 26, 1902, 327.

Neurogen is the name given by Dr. Alwin Miller to an artificial bathing salt, which is said to be composed of 73 per cent. of chlorides, 25 per cent. of sulphates, and 2 per cent. of a ferrous compound, together with a considerable quantity of glycerin. It is recommended for baths in 4 per cent. solutions for adults and 2 to 3 per cent. solutions for children.—Pharm. Centralh., June 26, 1902, 335.

Nicofebrin is the name given to an Italian specialty which is supplied both in capsules and in liquid form, and, as its name indicates, is recommended in febrile ailments—particularly when due to malaria. Its composition is not given.—Pharm. Centralh., June 26, 1902, 339.

Odda is the name given to an infant food prepared by Dr. J. v. Mering.

It contains egg-yolk in place of a portion of the casein ; cacao fat, flour, sugar, skim milk and whey, the proportions being adjusted so that the relations of casein to albumin correspond to the proportions in which they are present in mother's milk.—Pharm. Ztg., April 16 and May 7, 1902, 299 and 356.

Oresol is the name given to a Swiss specialty which is claimed to be an easily soluble and pleasant tasting guaiacol preparation from which guaiacol is split off when it reaches the intestinal tract.—Pharm. Ztg., May 17, 1902, 389.

"*Origos*" *Tablets* are a Hamburg specialty, introduced as a nutrient, and claimed to contain besides gluten all the substances, in soluble form, that are necessary to build up the human body, and particularly the bones.—Pharm. Ztg., Feb. 5, 1902, 102.

Ozonoform is a compound of ozone with a distillate obtained from the silver fir, which is recommended as an efficient disinfectant for the sick room and dwelling, and, in dilutions, is claimed to be useful as mouth wash and for gargling.—Pharm. Ztg., Nov. 9, 1901, 898.

Parolein is the name given to a Swiss specialty which is composed of pure vaselin oil and 1–5 per cent. of menthol. It is used as a nasal prophylactic and is applied by the aid of a nebulizer.—Pharm. Ztg., April 2, 1902, 262.

Peronine is the trade name given to the hydrochloride of benzyl-morphine, $C_{17}H_{17}NO.OC_6H_5CH_2.OH.HCl$, and is recommended as a substitute for morphine. It occurs as a light white powder, soluble in hot water and alcohol, but insoluble in ether and chloroform, and decomposes when heated to $200^{\circ}C$. Its physiological action is intermediate between codeine and morphine. It is inferior to the latter as regards hypnotic power, it is superior as regards the ease with which it is borne by the stomach, and does not provoke perspiration. The only untoward effect after its use is constipation, and the sleep which it causes is more calm, deeper and is not preceded by phenomena of excitement. Large doses in animals cause convulsions and heart failure. It has been used for all forms of pain with success, and particularly in the cough of tuberculosis. It is also useful as a local anæsthetic in eye-practice, etc. The dose is 0.02 to 0.04 Gms.—Nouv. Rem., Sept. 8, 1901.

Peroxols are disinfectant preparations, introduced by M. Beck, which are prepared by adding salicylic acid, carbolic acid, β -naphthol, thymol, camphor, menthol, quinine sulphate, or zinc chloride to hydrogen dioxide with the object of increasing its disinfectant qualities. The peroxide employed is of a 3 per cent. H_2O_2 strength, must be free from HCl , and should contain traces only of phosphoric acid as preservative. The medicaments named are present in the proportion of 1 to 2 per cent., and their solution is aided and effected by the addition of 33 to 38 per cent. of

alcohol. These peroxols are quite stable, possess a high antiseptic and disinfectant power, and are particularly useful for the disinfection of the hands.—Pharm. Ztg., Aug. 3, 1901, 619; from Ztschr. Hyg., 27, 294–306.

Phenacylphenacetin is a new compound which, according to "Pharm. Post," is prepared as follows: Phenacetin is dissolved in xylol, heated to boiling, and sodium is added in molecular proportion, followed by a molecular quantity of bromacetophone. The product of the reaction is filtered, evaporated to crystallization, and recrystallized from alcohol. Phenacylphenacetin is soluble in alcohol and in glycerin, insoluble in water, melts at 87° C., and is perfectly nontoxic.—Pharm. Ztg., Sept. 4, 1901, 706.

Propol (*Propolisin vasogen*) is the name given to a disinfectant specialty, recommended for the treatment of wounds, and for inhalation in catarrh, bronchitis, etc. Pharm. Ztg., April 26, 1902, 327.

Proteïnum Pyocyaneum Honl. is a preparation obtained by Honl and Bukovsky from cultures of the *Bacillus pyocyaneus*, by the method of Buchner by means of potassium hydrate solution. It constitutes a greenish-yellow, faintly alkaline fluid, and having the odor of linden blossoms. It possesses tolerable stability, and has been found useful in the treatment of ulcers.—Pharm. Ztg., Feb. 26, 1902, 159.

Purgatin is synonymous with "purgatol," the diacetyl-ester of anthrapurpurin (see Proceedings, 1901, 641).

Purgen is the trade-name given to a specialty recommended as an efficient purgative in small doses, which, according to Z. v. Vamossy is pure and simply "phenolphthalein."—Pharm. Ztg., June 11, 1902, 460.

Puroform is the name given to an antiseptic and disinfectant preparation, stated to possess powerful bactericidal properties combined with non-irritant qualities, which is composed essentially of a zinc formaldehyde compound, thymol, menthol and eucalyptol.—Pharm. Ztg., Nov. 27, 1901, 945.

Pyramidon—New Compounds.—In addition to camphorated pyramidon (see Proceedings, 1901, 642), E. Stadelmann recommends three new pyramidon (dimethylamido antipyrine) preparations, namely, neutral camphorate of pyramidon, acid camphorate of pyramidon, and salicylate of pyramidon. The effective dose seems to be about 0.50 to 0.75 Gm., the acid camphorate being given up to 1.0 Gm. Stadelmann claims particular advantages for these over simple pyramidon in the treatment of phthisis. Unpleasant secondary effects have not been observed.—D. Med. Wschr., 1901, No. 26.

Pyran Tablets are a Berlin specialty recommended for asthma, pulmonary ailments and rheumatism, two tablets being administered three times daily. According to the manufacturer's statement each tablet contains

0.5 Gm. of "benzoylnatrium thymico-oxybenzoicum."—Pharm. Ztg., May 7, 1902, 356.

Quinineurethane, a compound adapted by reason of its easy solubility in water for the subcutaneous administration of quinine, is prepared by Gaglio by treating 3 parts of quinine hydrochloride with 15 parts of urethane and 3 parts of distilled water. The preparation contains 1 mol. quinine and 2 mol. urethane, and is claimed to be non-irritant.—Pharm. Post, Feb. 23, 1902.

Rachitol is the name given by Friedel to a preparation recommended in the treatment of rickets.—Therap. d. Gegenw., 1901, 283.

Rheumasan is the name given to a superfatted salicylic acid soap, marketed in Vienna, and recommended as a gout remedy.—Pharm. Ztg., Jan. 25, 1902, 74.

Rheumatin is the name given to a compound of salicylic acid and the quinine ester of salicylic acid introduced by Zimmer & Co. under the name of salochinin (which see). It is a white crystalline compound, insoluble in water, and melting at 179° C., to which the following structural formula is given: $C_6H_4.OH.CO.O.C_{20}H_{23}N_2O.C_6H_4.OH.COOH$. Overlach finds this compound to possess excellent anti-rheumatic properties, and regards it as being superior to all the salicylic acid preparations heretofore proposed, not even excepting acetylsalicylic acid (=aspirin). He recommends that it be administered in 1 Gm. doses three times daily for three days, four doses on the fourth day, and omitting it every fifth day—then repeating in the same way. The compound is perfectly tasteless.—Pharm. Ztg., Aug. 31, 1901, 694.

Sanatolyn is the name given to a disinfectant produced in Austria, which is said to be composed of crude (so-called 100 per cent) carbolic acid, conc. sulphuric acid, a few per cent. of ferrous sulphate, and water. It is evidently intended only for the crudest form of disinfection. Analysis shows it to contain 17.53 per cent. of cresol and 27.54 per cent. of sulphuric acid. It yields only 0.91 per cent. of ash, and is therefore essentially a mixture of cresol sulphonate, free sulphuric acid and water.—Pharm. Ztg., Aug. 24, 1901, 674: from CEster Sanitativesen, 1901, No. 32.

Salochinin is the name given to the quinine ester of salicylic acid, which has the structural formula $C_6H_4.OH.CO.O.C_{20}H_{23}N_2O$. It is crystalline, insoluble in water, readily soluble in alcohol and ether, and melts at about 130° C. Overlach regards it as a mild form of quinine, possessing certain advantages over the ordinary quinine salts, and is possibly also a substitute for the so-called euquinine.—Pharm. Ztg., Aug. 31, 1901, 694.

Sangostol is the name given to a solution of calcium and iron iodide. It is said to be an agreeable preparation, and is recommended particularly for children in rachitis and for children in scrofulous complaints.—Pharm. Ztg., Nov. 8, 1901, 898.

Sanguigen Wine is a Bavarian specialty, which is said to be a carefully prepared wine of huckleberries containing iron and manganese. Two sorts are supplied, the one (No. 1) containing 0.14 Gm. ferric oxide and 0.21 Gm. manganic oxide in the liter, the other (No. 2) containing per liter 0.16 Gm. of ferric oxide and 0.30 Gm. manganic oxide.—Pharm. Ztg., April 16, 1902, 299.

Sanguinol is a preparation produced in Russia by drying sterilized calf's blood at a low temperature in a current of sterilized air. It constitutes a dark brown, odorless powder, which is readily soluble in water, and may be kept unchanged for a long time if preserved in opaque vessels in a cool place. It has the advantage of containing undecomposed hæmoglobin, which is said not to be present in other blood-preparations.—Pharm. Ztg., Nov. 27, 1901, 945.

Sapomenthol is the name given to a Galician specialty, in form of a salve, which is recommended as a remedy for gout, rheumatism and neuralgia, by applying it to the painful parts two or three times a day with vigorous friction. It is said to be prepared with medicinal soap, absolute alcohol, volatile oils, menthol, ammonia, and camphor.—Pharm. Centralh., June 26, 1902, 335.

Selenium H. p. p. (*Selenium hydrogenio peroxydate paratum*) is the name given by E. Klebs to an antitoxin prepared by the aid of hydrogen dioxide from *Diplococcus semilunaris*. It is used in connection with "*Tuberculocidin Te-Ce*" (see below), in the treatment of tuberculous skin diseases, as well as internally. Externally it has been found useful in prurigo, seborrhoea, scrofulous eczema, erythema induratum, etc., rapidly relieving the excessive irritation of the skin in such cases.—Pharm. Ztg., Feb. 19, 1902, 141.

Siccolum Ricini is the name of a Berlin specialty which is claimed to contain 50 per cent. of castor oil in dry form. It is said to be tasteless and odorless, and is administered in doses of 5 to 15 Gm., mixed with water.—Pharm. Centralh., May 22, 1902, 290.

Sirosol is the name given to a specialty, similar to "sirolin," and is said to be composed of 10 Gm. of potassium guaiacolsulphonate, 5 Gm. of fluid extract of orange peel, 30 Gm. of distilled water, and 105 Gm. of simple syrup. Its specific use is not indicated.—Pharm. Ztg., June 11, 1902, 460.

Solvosal-Kalium and *Solvosal-Lithium* are compounds of potassium and lithium respectively with *salol*-ortho-phosphinic acid. Both of these compounds are crystalline, have an acid reaction, and yield a white precipitate from their aqueous solution on addition of ferric chloride. The potassium salt dissolves in about 20 parts of cold water, but the clear solution becomes turbid on heating, owing to the ease with which *salol*-phosphinic acid is split up—the products of the decomposition being *salol*, salicylic acid, and potassium phosphate. The properties of the lithium

compound are analagous. It is, however, somewhat more soluble. Both compounds, but particularly the lithium compound, are recommended as efficient antiseptics, diuretics and antarthritics.—Pharm. Ztg., Aug. 31, 1901, 694.

Septoforma is the name given to an alcoholic potassium linoleate soap holding a condensation product of formaldehyde in solution, and recommended as an antiseptic, disinfectant, and deodorant in veterinary practice.—Pharm. Centralh., 1901, No. 43.

Serum Bromatum.—In line with the artificial sera, such as the physiological salt solution, Buvat has prepared and used with advantage several medicated artificial sera. He has found both the bromated and iodinated sera to serve a good purpose for the subcutaneous treatment of the insane. Serum bromatum contains 6 Gm. sodium bromide and 1.5 Gm. sodium chloride in 1 liter. It may be injected without danger to the amount of 500 Cc., and exercises marked effect in quieting the patient.

Serum Iodatum is obtained by dissolving 6 Gm. sodium chloride, 2 Gm. potassium iodide, and 2 Gm. sodium sulphate, in 1000 Gm. of water. This has proven very quieting in the treatment of the insane syphilitic, and may be injected in the same quantities as the bromated serum.—Pharm. Ztg., Mar. 1, 1902 ; from L'Union Pharm., 1902, No. 2.

Sitogen—Investigation of Composition.—According to A. Beythien, the vegetable substitute for meat extract introduced under the name of "sitogen," is probably an inspissated yeast extract seasoned with salt. Analysis bears out the claim that it is entirely a vegetable product. It contains 8.63 per cent. of albumoses, 32.19 per cent. of peptones and plant bases, a total nitrogen yield of 7.01 per cent. ; phosphoric anhydride, 5.19 per cent. ; chlorine, 7.01 per cent. ; water, 29.02 per cent. Although the preparation is elegant and palatable, and is cheap, the author does not consider it proved that the dietetic value of sitogen is equivalent to that of meat extract, merely on the strength of the presence of certain nitrogenous constituents in similar proportions.—Pharm. Journ., Oct. 26, 1901, 473 ; from Chem. Centralb., 1901, 2, 50.

Sterilized Iron Waters.—Adler has introduced sterilized iron waters on the ground that the ferric deposits which form in the ordinary chalybeate waters always contain micro-organisms in greater or less quantity. These micro-organisms are regarded by him as being the inciting cause to the promotion of deposits, which, he claims, are completely prevented by sterilizing the mineral water.—D. Med. Wschr., 1901, No. 26.

Tannatin is the name given to a preparation made from pines and firs, intended to be used as embrocation and for baths in the same way as the so-called pine-needle extract. It is a yellow liquid and has a pleasant resinous odor.—Pharm. Ztg., July 17, 1901, 574.

Tarchiol is the name given by Dr. Paterno to a new antiseptic, the

nature of which has not yet been divulged, which Dr. Dura extolled at a recent meeting of the Academy of Medicine of I sessing higher bactericidal power than mercuric chloride, and strongest antiseptic substance yet discovered.—Pharm. Post, F

"*Tavel*" *Tablets* are a Swiss specialty intended for the cor paration of Tavel's infusion solution, as well as for a rinsi aseptic operations. They are composed of 2.5 Gm. pure so nates and 7.5 Gm. pure sodium chloride each, one tablet bei for one liter of water.—Pharm. Ztg., Jan. 25, 1902, 74.

Thermarthrin is the name of a specialty recommended bandages, pills, and fluid, for the treatment of gout, rheumatis liquid is used as an embrocation, and is composed of equal p of mustard, spirit of camphor, spiritus formicarum, and eth Ztg., March 1, 1902, 170.

Thigenol is a substitute for ichthyol, prepared at Basel sodium salt of the sulphonic acid of a synthetic sulpho-oil, the la ing 10 per cent. of sulphur in permanent combination. It i water and diluted alcohol in all proportions, forming faintly a tions, and has been used with advantage in place of ichthyol purposes.—Pharm. Ztg., Feb. 5, 1902, 102.

Trinophenon is the name given to a Belgian specialty recor being indispensable for the relief and cure of burns. It is the manufacturer to be an organic chemical compound discov Dr. Schmid in 1898; but O. Langkopf states that it is simply solutions of picric acid (= trinitrophenol).—Pharm. Ztg., Ap 306.

Trunccek's Serum, recommended in the treatment of arteri obtained by dissolving 0.44 Gm. sodium sulphate, 4.92 Gm. s ride, 0.15 Gm. sodium phosphate, 0.21 Gm. sodium carbona Gm., in 95.0 Gm. of water, and sterilizing the solution by filtra a clay cylinder—finally adding 0.1 per cent. of resorcin to pre is used in daily doses of 2 Cc. by subcutaneous injection.— April 19, 1902, 306; from Rép. de Pharm., 1902, No. 4.

Tuberculocidin Te-Ce is the designation given by E. Klebs 1 cent. solution of the bactericidal and antitoxic substance of bacillus, to which 0.2 per cent. of cresol is added for its prese has been used with advantage and is recommended for the in ment of all tubercular affections, and is well borne by the adults as well as children. The initial dose for children unc old is one drop, while adults are given from three to five maximum dose for the latter being 2 Cc. The immunizing : the tubercle bacilli furnishes a preparation which Klebs has na

Tuberculo-Protein, one cubic centimeter of the preparatio

10 Mgm. of the substance. It is used in connection with the preceding preparation and also with the *Selenium H. p. p.* (which see), when, after prolonged treatment, these begin to lose their efficiency.—Pharm. Ztg., Feb. 19, 1902, 141.

Uranium Wine, or "*Vin Urané Tesqui*" is said to be a preparation containing uranium nitrate, pepsin, wine, etc., which is useful in the treatment of diabetes, allaying in particular the intolerable thirst of the patient suffering from that disease.—Pharm. Ztg., Oct. 19, 1901, 838.

Urol is the name given to urea kinate, and is recommended for the treatment of gout and gravel. According to C. v. Noorden it is composed of two mol. of urea and one mol. of kinic acid, has an acid reaction, melts at 107° C., and is quite soluble in water and in diluted alcohol, and may be readily recrystallized from these if moderate temperature be employed, but on prolonged heating at 70°–100° C., it is decomposed, ammonia and carbonic acid being formed. The author has found it quite efficient for the purposes mentioned.—Centralb. f. Stoffwechselkr., 1901, No. 17.

Valearin is the name given by C. Jacoby to "valeryltrimethyl ammonium chloride," a compound possessing similar physiological action to the corresponding isoamyl compound, designated as "amylarin," which see.

Valerydine is the trade name given to a compound of valerianic acid and phenacetin, which, combining the nerve calming properties of valerian and the antipyretic properties of phenacetin, is recommended as particularly suited in cases of neuralgia, migraines, hysteria, &c. It occurs in the form of shining needle-shaped crystals, soluble in alcohol, chloroform and acetone, less soluble in ether, and almost insoluble in water. It melts at 120° C. The daily dose is 0.5 to 1 Gm., given in form of wafers.—Amer. Drugg., April 14, 1902; from Form. Med. Nouv., 1902, 292.

Valyl is the trade name given to valerianic acid-diaethylamide— $\text{CH}_3\text{--CH}_2\text{CH}_2\text{CH}_2\text{N}(\text{C}_2\text{H}_5)_2$ —which is recommended for the treatment of hysteria, traumatic neurosis, menstrual disturbances, &c. It is a colorless liquid, has a peculiar odor and a sharp burning taste, and must therefore be administered in form of capsules, the dose being 0.125 Gm., two or three times a day.—D. Med. Wchschr., 1901, No. 49.

Varoma is the name given to an American specialty said to be composed of a variety of volatile coal-tar derivatives, and recommended as a disinfectant and purificant of the air in dwellings. It is said to be perfectly harmless.—Pharm. Ztg., May 17, 1902, 389.

MATERIA MEDICA.

A. VEGETABLE DRUGS.

GENERAL SUBJECTS.

Official Vegetable Drugs—Revision of Definitions and Descriptions.—At the time of the revision of the U. S. P., 1890, Prof. Henry H. Rusby introduced, in association with his fellow members of the sub-committee on Botany and Materia Medica, various suggestions for improvement, but did not venture to criticise the general form or style of the text, nor to make searching comparisons as to minute details; but immediately after publication, such a course was systematically entered upon by him, and no opportunity has been missed during the intervening decade for studying specimens of crude vegetable drugs, even the commonest and best known. Most of them have been studied in numerous samples, many of them in the field condition, and copious observations have been made as to the range-limits of physical character, while in many cases the conditions and causes of such variations have been sought. At the same time that greater accuracy has thus been attempted, an endeavor has been made so to adjust the order of description as to bring the latter into the standard style of the class of scientific descriptions to which it belongs, using simple and non-technical language wherever practicable, but the more accurate technical phraseology when deemed important or necessary. The results are communicated under individual headings, beginning with "absinthium" and ending with "xanthoxylum," in *Drugg. Circ.*, Sept., Oct. and Nov., 1901, 181-184, 203-207 and 224-227.

Crude Drugs—Necessity of a More Particular Pharmacopœial Description.—The prevailing practice of supplying and demanding crude drugs in the pressed and powdered condition at the present time, leads M. I. Wilbert to enter a plea for a more extended and particular description of these organic medicaments, notably in defining the color of the powder and the prominent and characteristic microscopic elements. A step in the right direction, moreover, will be taken if, at the meetings of the local, state or national associations, the members of the pharmaceutical profession will declare their willingness to adopt a pharmacopœia that will include reliable and up-to-date tests for articles of the organic materia medica as they occur in the ordinary channels of trade at the present time.—*Amer. Jour. Pharm.*, June, 1902, 271-275.

Crude Drugs and Chemicals—Reference to U. S. P. Preparations into which they Enter.—W. O. Richtman, calling attention to the convenience of a list of preparations into which a particular drug, chemical or preparation enters, as attempted in the U. S. P., 1890, and previous editions,

mentions that these lists are in some instances inaccurate, and in general deficient in information. He has prepared a complete list of the drugs and chemicals official in the U. S. P., 1890, and mentions under each title all the preparations into which they enter. This list will doubtless prove a valuable aid for establishing similar references in the forthcoming revision of the U. S. P., and may be consulted in Pharm. Archives, Jan., Feb., Mar. and April, 1902, pp. 7-20, 21-36 and 45-60.

Powdered Drugs—Ash Determination.—With the advance in industrial methods it is but natural that the production of powdered drugs by the pharmacist should give way to the purchase of the powders produced by manufacturers. Such powders excel in so far as experience is concerned, but to establish their identity and quality is far more difficult than is the case when the whole drug is under examination. Dr. L. Glaser, who has heretofore made valuable contributions concerning the anatomical and microscopic characters by which certain leaf-powders may be identified and distinguished, now contributes an interesting paper on the importance of determining the ash content of such powders, not alone for the purpose of detecting adulterants, but also to determine to what extent a genuine powder may represent the entire leaf—much depending upon the practice not unfrequently observed of collecting only the finer, easily pulverizable portions and rejecting the coarser and more fibrous portions of drug. The results of his determinations in this direction are exhibited in the following table :

NAME OF LEAF-POWDER.	Manufactured.		Purchased in a Pharmacy.	Prepared by the Author.	Whole Leaves.	
	A.	E.			From a Botanical Garden.	According to Arth. Meyer (Wiss. Drug. K.).
Folia althaeæ	—	—	—	16.9 p. c.	—	—
Folia belladonnæ	14.6 p. c.	—	—	—	11.2 p. c.	—
Folia cocæ	5.3 p. c.	—	8.1 p. c.	6 p. c.	—	—
Folia digitalis	8.8 p. c.	—	7 p. c.	—	—	about 10 p. c.
Folia eucalypti	7.7 p. c.	—	—	—	—	—
Folia farfaræ	—	41.7 p. c.	17.9 p. c.	18.1 p. c.	17.6 p. c.	17 p. c.
Folia jaborandi	7.1 p. c.	—	—	—	—	—
Folia juglandis	—	—	—	7.5 p. c.	—	5.3 p. c.
Folia malvæ	—	18.5 p. c.	—	17.6 p. c.	—	—
Folia melissæ	—	—	—	11.7 p. c.	—	—
Folia menthæ piperitæ ..	18.5 p. c.	—	11.4 p. c.	—	—	—
Folia nicotianæ	—	—	—	20.2 p. c.	—	19-28 p. c.
Folia patchouly	22.2 p. c.	—	—	15.7 p. c.	—	—
Folia rosmarini	6.7 p. c.	—	—	—	—	—
Folia salviæ	45.7 p. c.	18.6 p. c.	9.5 p. c.	—	9.4 p. c.	—
Folia sennæ Alex	11.5 p. c.	—	—	—	—	9-12 p. c.
Folia sennæ sine resina ..	11.6 p. c.	—	—	—	—	9-12 p. c.
Folia sennæ Tinnevelly ..	11.9 p. c.	11.1 p. c.	9.9 p. c.	—	—	9-12 p. c.
Folia stramonii	21.3 p. c.	—	—	—	13.3 p. c.	17.4 p. c.
Folia trifolii fibrini	8.2 p. c.	—	—	—	—	—
Folia uvæ ursi	—	—	2.4 p. c.	—	—	3 p. c.

The author concludes that it is advisable to include in future the Pharm. Germ. not only micro-anatomical descriptions of plants but also a definition of the ash-limits in such.—Pharm. Z. 1901, 692.

In continuation of his ash determinations in powdered drugs the author communicates the results of such obtained with a number of flowers, fruits and seeds which are exhibited in the following table.

NAME OF DRUG.	Manufactured Powder.		Whole Drug.		Q
	G.	L.	Personal Experiment.	According to Arthur Meyer.	Between Manufacturer and Powder.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Flores convallariæ majalis.	8.4	11.0	—	—	—
" cassiæ	4.5	4.4	—	—	—
" chamomillæ vulg.	9.8	8.7	9.8	—	—
" chrysanthemi	6.5	7.6	—	—	—
" cinæ	10.0-10.4	11.4	6.6	6.5	—
" croci (= stigmatæ) ..	4.8- 5.2	4.6	4.8	4.5- 7.5	—
" koso	23.2	19.3	6.8	6.0	—
" lavendulæ	6.6- 6.9	11.5	6.3-6.6	—	—
" pyrethri rosei	8.8	—	—	—	—
" rosæ	4.2	7.6	4.5	—	—
Fructus anethi	9.0- 9.2	7.5	8.0	—	—
" anisi stellati	3.2- 3.5	3.0	2.9	—	—
" anisi vulgaris	8.0- 8.4	10.1	7.8	6.7	—
" aurantii immatur.	6.9- 7.1	5.5	6.5	—	—
" capsici annui	5.4	4.8	6.8	—	—
" cardamom, Ceylon	11.4-11.6	12.2	10.8	{ 6.5-14.2	—
" Cardamom, Malabar	5.2	10.3	6.7	{ 6.5-14.2	—
" carvi	8.2	9.7	5.6	5.3	—
" colocynthidis	8.5- 8.8	5.9	11.4	1.0	—
" conii maculati	7.4	—	4.6	—	—
" coriandi	6.1	6.7	5.6	—	—
" foeniculi	7.9- 8.1	10.5	7.2	7.3	—
" juniperi	3.3- 3.5	4.9	3.2	4.0	—
" lauri	1.5	1.6	1.6	3.2	—
" phellandri	8.5	10.1	7.7	8.0	—
" sabadillæ (sine oleo)	9.0	6.7	6.9 (cum oleo)	—	—
" syzygii jambolani.	2.1	2.8	1.9	—	—
Semen amonis	4.0	3.5	3.5	—	—
" cardui maris siccæ	5.9- 6.1	—	—	—	—
" colchici	3.6	3.9	3.0	2.7	—
" colocynthidis	5.1- 5.3	—	2.3	—	—
" erucæ (sine oleo) ..	6.4- 6.7	4.7 (cum oleo)	6.4 (cum oleo)	—	—
" foenugraeci	5.0- 5.1	5.2	3.3	3.7	—
" hyoscyami (sine oleo)	8.0	8.5	4.9 (cum oleo)	—	—
" oryzæ	0.5	0.5	—	—	—
" sinapis nigr. (sine oleo)	7.7	5.5 (cum oleo)	4.2 (cum oleo)	4.0 (cum oleo)	—
" staphidisagriæ (sine oleo)	21.5	22.3	10.2 (cum oleo)	—	—
" strophanthi kombé (sine oleo)	5.9	9.1 (cum oleo)	4.3 (cum oleo)	—	—
" strophanthi hispidi (sine oleo)	6.8	5.5	3.8 (cum oleo)	—	—
" strychni (sine epiderm.)	1.5	1.5	1.0	{ 1.4 {	—
" strychni (cum epiderm.)	2.5	1.6	1.1	—	—

The figures obtained by the author's "personal experiments" for the whole drug in the above table may be accepted as normal for the

tent that should be obtained from drugs of good quality.—Pharm. Ztg., Oct. 19, 1901, 836–837.

Vegetable Powders—Diagnostic Characters.—In continuation of the series of papers on the diagnostic characters of vegetable powders (see Proceedings, 1901, 652), Prof. Henry G. Greenish and Eugene Collins have contributed to the "Pharmaceutical Journal" during the year—these papers, as were the previous ones, being illustrated by excellent cuts showing the microscopic features that characterize the powder under consideration. Beginning in the number of the "Journal" of Aug. 31, 1901, under the caption "Section 3—Powdered Leaves," the chief diagnostic characters of powdered leaves in general are given: (*a*) the shape and appearance of the cells of the epidermis and mesophyll; (*b*) the stomata, their distribution and relation to the surrounding cells; (*c*) the presence or absence of secretory tissue; its nature if present; (*d*) the presence or absence of glandular hairs and their nature; (*e*) the presence or absence of crystals; (*f*) the presence or absence of pericyclic fibers; (*g*) the elements of the midrib. Of particular vegetable powders the following are considered in this number: *Folia aurantii* (p. 295), *Atropa belladonna* (p. 296), *Betonica officinalis* (p. 296), *Erythroxylon coca* (p. 297) and *Conium maculatum* (p. 297); in the number of October 19, 1901: *Digitalis purpurea* (p. 453), *Ilex paraguayensis* (p. 453), *Hyoscyamus niger* (p. 454), *Pilocarpus jaborandi*, Holmes (p. 454), *Nicotiana tabacum*, L. (p. 455), *Ruta graveolens*, L. (p. 455), *Juniperus sabina*, L. (p. 455), *Cassia acutifolia*, Delile (p. 456); in the number of January 4, 1902: *Datura stramonium*, L. (p. 2), *Camellia thea*, Link (p. 2), *Pneumus boldo*, Mol. (p. 3), *Barosma betulina*, Bart. and Wendl. (p. 3), *Areto-staphylos uva-ursi*, Sprengel (p. 3), *Salvia officinalis*, L. (p. 4), *Lawsonia inermis*, Lin. (p. 4). Under the caption "Section 4," the anatomical characters presented by

Powdered Flowers and Flowering Tops from the plants below mentioned are given. In the number of May 17, 1902: *Anthemis nobilis* (p. 411), *Eugenia caryophyllata* (dried flower buds, p. 412); in the number of June 7, 1902: *Brayera anthelmintica* (p. 492), *Cannabis sativa*, L. (p. 492), *Convallaria majalis*, L. (p. 493), *Crocus sativa*, L. (p. 494), *Artemisia maritima*, var. *a*—*Stechmanniana*, Besser p. 494).

Drug Adulteration—Modern Methods.—Lyman F. Kebler speaks interestingly on the subject of the adulteration of drugs and particularly of modern methods. He says that many of the reports bearing upon the adulteration of food products and medicinal preparations, which come to hand from time to time, are of such a character that at the time of reading we are almost overawed by the number of sophisticated or adulterated articles reported. Tables are reported which would indicate that from 50 to 75 per cent. of the articles examined are adulterated or spurious. If this

is really a correct representation of the facts as they exist we would be compelled to admit that this country must be a veritable happy hunting-ground for the manipulator. But upon closer examination it will be found that these reports are "reports of adulterations" in the full sense of the word, and that when a man starts out to find adulterations he is usually successful. Taking the whole field into consideration, the author does not believe that these reports present the actual existing condition of affairs. For while the number of adulterants reported is found to be comparatively large, the proportion of intentional adulterations actually met with do not exceed 5 per cent.; and from an extended experience in examining a vast number of articles, he is led to believe that adulterations practiced are very much less than this. After going into the details of some adulterations that have come under his notice recently, or within the past few years—these embracing chemicals, soluble oils and simple drugs, the more interesting of which have been abstracted for this report—the author observes that, although gross adulterations are very little practiced at present, the little that is moderately practiced is carried on in such a way that in most cases the adulteration is not perceptible to the naked eye, and that it is necessary to resort to the test tube, the analytical balance, the microscope and the polariscope, before positive conclusions can be arrived at.—*Amer. Journ. Pharm.*, Jan., 1902, 12-25.

Drugs and Food Products—Adulteration.—Dr. Albert Robin, Pathologist and Bacteriologist of the Delaware Board of Health, read a comprehensive and highly interesting paper on the adulteration of drugs and food products before the Philadelphia College of Pharmacy, February, 1902, which may be consulted with advantage in *Amer. Journ. Pharm.*, April, 1902, 177-193.

ALGÆ.

Carragheen—Nourishing Constituent.—According to the investigation of J. Sebor, the nourishing constituent of *chondrus crispus* is a complicated carbohydrate composed of galactose, glucose, fructose, and a small quantity of pectose.—*Pharm. Journ.*, July 13, 1901, 34; from *Osterr. Chem. Ztg.*, 3, 441.

Nori—Chemical Investigation of—A Japanese Preparation from Seaweed.—K. Oshima and B. Tollens have made a chemical investigation of the constituents of "nori," a preparation of the seaweed

Porphyra laciniata, employed in Japan in the form of tablets as a food. The presence of fructose and other ketoses was demonstrated. By oxidation with nitric acid, mucic and saccharic acids were obtained, and, after hydrolysis, both the phenylhydrazine compounds of i-galactose and d-mannose. In addition to these sugars nori also probably contains some fucose, as well as other pentoses and glucoses.—*Pharm. Journ.*, Oct. 26, 1901, 473; from *Chem. Centralb.*, 1901, 2, 51.

BACILLARIÆ.

Bacteria—Differentiation of Two Distinct Species in Vinegar.—G. Bertrand and R. Sazerac have observed a very distinct differential character between two species of acetic ferments they often meet with, viz., the bacteria of vinegar (*Mycoderma aceti*) and the bacteria of sorbose (*Bacterium xylinum*). The first species is of the type of a ferment. Two samples of this, from different sources, have been examined, and they differ very slightly one from the other. Conical vessels containing 50 Cc. of broth, with 0.5 per cent. of yeast and about 2.5 Cc. of alcohol, were infected and kept at a temperature of 28°. The acetic acid found was as follows :

	Six days. Gms.	Ten days. Gms.	Seventeen days. Gms.
Microbe from Orleans	1.53	2.81	2.45
Microbe from Paris	1.43	2.35	2.52

The second species, from sorbose, was sown in a broth containing glycerin and peptone, and after two or three days a liquor was obtained precipitating Fehling's Solution in the space of a few seconds ; it oxidizes the glycerin and forms dioxycetone or propanediolone.—Chem. News, March 27, 1902, 155 ; from Bull. Soc. Chim. de Paris (3), xxv, No. 14.

Bacteria—Inefficiency of Ozone to Diminish their Activity.—See Ozone under "Inorganic Chemistry."

Tubercle Bacillus—Thermal Death Point.—R. T. Hewlett has made experiments on the thermal death point of the tubercle bacillus, from which he draws the following conclusions : (1) As regards a non-virulent laboratory culture a temperature of 60° C. acting for ten minutes is sufficient to destroy the vitality of the bacilli. (2) A temperature of 65° C. acting for fifteen minutes destroyed the infective properties of tubercular sputum in five out of six instances. (3) Tuberculous milk heated to 60° C. for thirty minutes lost its infective power. (4) Tuberculous milk heated to 68°–65° C. for twenty minutes in the Allenbury's Pasteurizer lost its infective power. (5) In all probability, pasteurization in which the milk is retained at a temperature above 65° C. for not less than twenty minutes is efficient, especially if no film is formed.—Pharm. Journ., Sept. 7, 1901, 313 ; from Trans. Roy. Inst. of Pub. Health.

FUNGI.

Yeast—Influence Bearing on its Nutrition.—A. L. Stern has determined the effect of varying the concentration of the sugar, the temperature of fermentation, the amount of seed-yeast, and the time, on the nutrition of yeast. He concludes that any increase of nitrogenous or inorganic nutrient beyond a definite limit will not increase either the amount of nitrogen assimilated by the yeast, or the weight of the yeast ; this limit is

but little greater than the largest amount which the yeast is able to assimilate under the conditions of the experiment. Any increase of the sugar is accompanied by an increase of the weight of nitrogen assimilated and of the weight of the yeast. This increase goes on up to the strongest concentrations which can be completely fermented. The rate of increase is greatest at the lowest concentrations, and falls off gradually as the concentration rises. Temperatures between 12° and 25° C. have but little influence on the weight of nitrogen assimilated and the weight of the yeast crop. At higher temperatures reproduction is weakened. The weight of the nitrogen assimilated and of the yeast crop is composed of two quantities: the weight of the seeding *plus* a quantity dependent on the composition of the solution. The growth of the yeast is during a portion of the fermentation proportional to the amount of sugar fermented, and proceeds as long as any sugar remains unfermented.—Pharm. Journ., July 21, 1901, 62; from Proc. Chem. Soc., 17, 126.

Dried Yeast—Preparation and Characters.—Jouisse gives the following method of preparing dried yeast for medicinal purposes: The yeast, which must be fresh, is first washed with iced water till the washings are colorless, then collected and submitted to pressure in a tincture-press. The residue is then completely dried in a current of air at a temperature not exceeding 35° to 38° C. The characters given are: Color, a pale brown; odor, faint; taste, pleasantly bitter taste of hops. A good yeast causes fermentation in from twelve to fifteen minutes in three times its weight of 10 per cent. sugar solution, at a temperature of 30° C. Iodine solution should not give a blue color with yeast.—Chem. and Drugg., Feb. 1, 1902, 216; from Bull. Soc. Pharm.

Yeast—Preparation of "Lower" Yeast that Incites Fermentation at "Higher" Temperatures.—George Jaquemin observes that up to the present the methods of making beer could be divided into two great classes, according to whether the yeast was "high" or "low." The low yeasts are always used at a temperature below 10° C., while the high yeasts are always used at a temperature above 10° . The beers obtained by the low fermentation have always a tendency to re-ferment if kept at a higher temperature than that of the original fermentation. The author has succeeded in modifying the conditions of existence of all the low fermentation yeasts, making them acquire the property of fermentation at a high temperature, even above 20° , while retaining in the beer the characteristic qualities demanded by the public.—Chem. News, March 27, 1902, 155; from Bull. Soc. Chim. de Paris (3), xxv, No. 14.

Ergot—Preparations of the B. P.—J. C. McWalter observes that the position of ergot is unique, both in medicine and in pharmacy. Few drugs have such a definite physiological action, and scarcely one is known whose properties are so characteristic. Yet the pharmacy of ergot is rather a

reproach to British chemists, and the extractum ergotæ fluid resin of the Pharmacopœia, supposed to represent the summit of scientific skill at the end of the nineteenth century, is a wretched product, which it behoves the conference to have removed from its pages. The ergotin of the Pharmacopœia, or rather the solid extract, is a creditable scientific preparation of definite physiological action and tolerably uniform strength. After a critical review of the chemical, pharmaceutical and physiological history of this important drug, the author sums up his conclusions concerning its preparations, as follows: (1) Ergot has at least two distinct actions, one on the uterus, the other on the blood vessels, and pharmacists should have preparations posssssing one or other of these properties in the most active degree. (2) Ergot comprises a number of distinct chemical substances, but so few of these can be recognized as definite entities, and so many different names have been applied to them, that it is premature to decide whether cornutine or any other alkaloid is the active principle. (3) The extractum ergotæ of the B. P. is a fairly satisfactory product, but ought to be regulated to a definite consistency. The fluid extract is a poor article and a much better solution can be obtained by dissolving one part of the extract and one of glycerin in a sufficiency of distilled water to make five parts. (4) The ammoniated tincture has a moderately effective action in constricting the capillaries, but it is not suitable for obstetric work, being weak, bulky, bitter and nauseous. (5) When fresh ergot is bruised and an infusion made and drunk immediately the active principles are obtained in as correct proportion as in the most elaborate extracts, but an infusion made from old ergot powdered even for a week, or concentrated infusions are a disgrace to pharmacy. (5) Trimethylamine is a decomposition product, and its existence denotes deterioration of the sample. —Trans. Brit. Pharm. Conf., 1901, 417-422.

GRAMINACEÆ.

Graminaceæ — Micro-Anatomical Description of Edible Fruits. — Mitlacher has made a comprehensive micro-anatomical study of a number of edible graminaceous fruits, not commonly known as such in Europe, his observations forming a valuable contribution to the pharmacognosy of the Graminaceæ. His studies include six plants, viz.:

Coix lacrymæ, L., tear-grass, the fruits of which, familiarly known as "Job's tears," are employed in China, after the removal of the hard shell, as food, in the form of mush and bread.

Andropogon Sorghum, L., the fruits of which, known under the name of "durrha," constitute the most important bread-plant of Africa. This, and the varieties *Sorghum vulgare* and *Sorghum saccharatum*, were examined and are described by the author.

Pennisetum typhoidum, L., known as "negro-millet," is cultivated in many varieties in Central Africa, Arabia, and the East Indies.

to North America.

Eleusine Coracana, Gärtn., the fruits of which, known by the names "coracan" or "uimbi," constitute along with those of the different *Sorghums* the most important fruit product.

Eragrostis Abyssinica, Link., is an important food plant in Abyssinia, the fruits being known by the name of "tef."

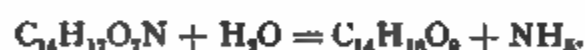
The micro-chemical description of these several fruits, which is accompanied by numerous illustrations, is available only in the original, which may be consulted in *Ztschr. d. Allg. Oester. Ap.-Ver.*, 1901, Nos. 34-39.

Sorghum Vulgare—*Poisonous Effect of Young Plants Due to Prussic Acid*.—Professor Wyndham R. Dunstan and Dr. T. A. Henry have investigated the nature of the poison contained in the young plants of *Sorghum vulgare*, the great millet or guinea corn (the *Juār* of India or *Dhurra shirshabi* of Egypt), which yields an important food-grain. The young plants have proved fatal to animals, especially in Egypt, and the authors show that the young plant, but not the seeds or old plants, when crushed with water, furnishes prussic acid (about 0.2 per cent. of the dried plant). The acid is not present in the free state, nor is it produced by acting on the plant with boiling water or with alcohol. The production of the poison is due to the action of a hydrolytic enzyme, apparently identical with the emulsin of bitter almonds on a cyanogenetic glucoside which has been named

Dhurrin. This glucoside has been proved to be derived from parahydroxymandelic nitrile by the association of the residue of one molecule of dextrose. Its formula is therefore $C_{14}H_{17}O_7N$. It crystallizes well, and is soluble in both water and alcohol. When hydrolyzed by emulsin or by dilute acids it is converted into parahydroxybenzaldehyde, dextrose, and hydrocyanic acid according to the equation—



When warmed with alkalies, dhurrin is resolved first into dhurrinic acid and ammonia—



This acid subsequently undergoes further hydrolysis when warmed with dilute hydrochloric acid into parahydroxylmandelic acid and dextrose—



Dhurrin differs from the other two known cyanogenetic glucosides, the amygdalin of bitter almonds and the lotusin found by the authors in

Lotus arabica (which see) in being derived from dextrose and not from maltose. The authors point out the protective purpose served by the existence of the cyanogenetic glucose in the young plant, and they are

at present engaged in examining several other plants which have furnished prussic acid, among them being *Manihot utilissima*, *Linum usitatissimum*, *Lotus australis*, and *Phaseolus lunatus*.—Chem. and Drugg., June 7, 1902, 896.

Melocanna Bambusoides—*Gigantic Seed*.—Dr. Otto Stapf exhibited at a recent meeting of the Linnean Society several seeds of a species of bamboo, *Melocanna bambusoides*, which completely upset the popular idea as to the dimensions of grass seeds. In *Melocanna*, each distinct seed measures five inches in length and three inches in diameter, forming a massive pear-shaped body, which is totally distinct, as regards size, from any hitherto known grass seed. The great store of nutriment contained in this huge seed probably serves to support the newly germinated plant until such time as it has firmly established its growth and has pierced the dense-growing jungle which is its habitat. Thus, probably, the reproduction of the species is more efficaciously effected by a few enormous seeds than by a very large number of smaller ones, which would produce weaker seedlings.—Pharm. Journ., May 24, 1902, 430; from Gard. Chron., 31, 211.

PALMACEÆ.

Cocos Nucifera—*Anatomy of the Fruit*.—A. L. Winton has contributed from the Connecticut Agricultural Experiment Station, New Haven, Conn., the results of his study of the macroscopic and histological structure of the fruit of *Cocos nucifera*, undertaken with particular reference to the fact that the shells are known to serve as adulterants of various powdered spices—pepper, cloves, allspice, nutmeg, etc.—and to enable the detection of the adulterant. The paper, which cannot be profitably condensed within the limits of this report, is illustrated by numerous cuts which serve to explain and to lead to a clear understanding of the relation of the various parts of the fruit to each other, and of their microscopic structure. In a final chapter, the application of this knowledge to the detection of adulteration is pointed out, the whole concluding with a table exhibiting as a valuable adjunct to the microscopical features described, the chemical composition of the spices before named and of coconut shells.—Amer. Journ. Pharm., Nov., 1901, 538–555; from The Am. Journ. of Science, October, 1901.

MELANTHACEÆ.

Veratrum Album—*Localization of Alkaloids*.—By micro-chemical tests, Rundqvist locates the greater portion of the alkaloids of *Veratrum album* in the cell contents of the starch-bearing cells of the rhizome and rootlets. No alkaloids were present in the elements of the medullium nor in the cells of the endodermis. The older portions of the rhizome were richest in alkaloids, which was chiefly located in the contents of these cells, which are thrust inwards in the neighborhood of the endodermis. The cell walls contain no alkaloid. A smaller amount was detected in the scales of the

rhizome and in the leaves. The veratroidine reaction was relied on for the detection of the alkaloid. Sections were macerated in strong HCl and warmed, when the characteristic red coloration was obtained with those elements containing the bases.—Pharm. Post, 34, 117.

White Hellebore—Method of Assay.—In response to a "query," Frederick T. Gordon communicates the following method for assaying white hellebore (the root of *Veratrum album*), which is modeled after Lyons' "Drug Assaying," and has proven reliable if carefully carried out: Weigh out 12 Gm. of the drug in fine powder and put into a 4-ounce bottle, pour on it exactly 100 Cc. of a mixture of ether 90 Cc., chloroform, 15 Cc., shake well, so as to wet the drug thoroughly and add 5 Cc. of 10 per cent. ammonia water, shake well and set aside for six hours, with frequent shaking. Add a few Cc. of water (to make the drug "lump") and pour off exactly 50 Cc. of the ether-chloroform solvent = 6 Gm. drug, evaporate to dryness in a dish on a water-bath. Take up the residue with a little ether, add 10 Cc. of dilute acetic acid, evaporate off the ether, filter through the smallest possible filter-paper into a 1-oz. bottle, wash out the dish with a little ether and acetic acid as before and run the acid solution through the filter, repeat again if a drop of the last washings give a precipitate with Mayer's reagent. There will now be a solution of the acetates of the alkaloids in the 1-oz. bottle. Now add to this ammonia in slight excess and ether, 10 Cc.; shake well, let the ether separate and pour off carefully into a tared beaker, repeat the washing with 5 Cc. of ether each time until a drop evaporated on a porcelain crucible cover gives no reaction for alkaloids, collecting the ether washings in the tared beaker. Evaporate to dryness in a water-bath, dry to constant weight and weigh = total alkaloids from 6 Gm. of the sample; from this calculate the percentage of total alkaloids. A good sample of white hellebore should contain from 0.45 to 0.60 per cent. of total alkaloids, and one assaying less than 0.30 per cent. should be rejected.—Proc. Pa. Pharm. Assoc., 1901, 125-126.

ASPARAGINEÆ.

Asparagus Seed—Chemical Examination.—In view of the fact that the seeds of *Asparagus officinalis* have some resemblance in their shape and appearance to stramonium seeds, and are used for preparing a copper substitute, W. Peters has subjected these seeds to chemical examination. Asparagus seeds contain an abundance of fixed oil in the cells of the endosperm, which has been the principal constituent subjected to examination. It is present in the seeds to the amount of 15.8 per cent., is reddish-yellow in color, thickens rapidly on exposure to air in thin layers. and has the following constituents: Sp. gr., at 15°, 0.928; refraction index in Zeiss's refractometer at 25° C. = 75 (1.75); saponification number, 194.2; iodine number (after 18 hours reaction of iodine solution), 137.1; acetyl acid

number, 179.2; acetyl saponification number, 204.4=(acetyl number, 25.2). Analysis shows the oil to consist of the glycerides of palmitic, stearic, oleic, linoleic, linolenic, and isolinolenic acids. The other constituents of asparagus seeds are the following: cellulose, 8.25 per cent.; albuminoids, 18.09 per cent.; mannan (=reserve cellulose), yielding by hydrogen, 37.53 per cent. of mannose. The seeds lost on drying 11.52 per cent. of water.—Arch. d. Pharm., 24., No. 1 (Jan. 17, 1902), 53-56.

SMILACEÆ.

False Sarsaparillas—Various Central- and South-American Sorts.—C. Hartwich describes a number of so-called sarsaparilla roots from various parts of South and Central America, which have reached Europe under the name of sarsaparilla or are so designated in the home of their production.

“*Sarsaparilla*” from *Nicaragua* resembles in its appearance and structure the official sarsaparillas, of the type of Honduras sarsaparilla, the endodermal cells being uniformly but very strongly thickened. It is probably derived from a *Smilax*.

“*Sarsaparilla*” from *Columbia* is also probably derived from a *Smilax*. The cells of the endoderm, conforming to the type of Vera Cruz sarsaparilla, are very strongly thickened, and outwardly fortified by ten rows of stone cells. The root sheds the bark at an early period, and this explains the thickening of the endoderm.

“*Sarsaparilla do Mato*” is the name given in Brazil to the roots of two plants, *Herreria Sarsaparilla* and *Rajania cordata*, Vell., which have a structure very similar to that of the Columbian.

“*Sarsaparilla*” from *Argentina* is of two kinds. The one from an unidentified species of *Smilax*, which is characterized by an extraordinarily thick bark and remarkably faintly developed endoderm; the other, the rhizome of *Mühlenbeckia sagittifolia*.—Schwz. Wchschr. f. Chem. u. Pharm., Jan. 11, 1902, 18-19.

Paris Quadrifolia, L.—*Presence of Saccharose in the Fruits.*—N. Kromer obtained from the dried and powdered fruits of *Paris quadrifolia* L., after removal of the oil by means of petroleum ether, on extraction by percolation with hot 96 per cent. alcohol and concentration, a sweet, syrupy liquid, which deposited well developed crystals of a sweet substance; this, on examination, proved to consist of cane sugar. The fixed oil extracted from the seeds was of a green color and amounted to 17.16 per cent. The author also gives some fragmentary information concerning the red coloring matters of these poisonous fruits, which may serve for their identification.—Arch. d. Pharm., 239, No. 5 (July 6, 1901), 393-395.

LILIACEÆ.

Aloes—Curaçoa Variety Supplied for the Different Sorts.—According to Lyman F. Kebler's investigations there is good reason for thinking that Curaçoa aloes, more or less dried, is the source of nearly all the commercial varieties. If this is so, the Pharmacopœia should recognize only the Curaçoa variety or introduce differentiating tests. The method for estimating the percentage of aloin should certainly be carefully tested. The following analysis lends force to this: Soluble in alcohol, 91.4 per cent., 29.34, 82.66, 98.28, 96.5. All of the above results were obtained from the so-called variety of Curaçoa. The percentage of solubility in all cases includes the amount of water present, which varied from 5 to 25 per cent. The sample which contained only 29.34 per cent. of alcohol-soluble material was found to be contaminated with 53.83 per cent. of ash. The aloin in the above samples varied in percentage according to the impurities present. A good aloes should contain at least 20 per cent. of aloin. That there is much uncertainty as to the variety of aloes supplied is clearly set forth in a letter received by Mr. Kebler from a prominent importer, who states that no aloes have been exported from Barbadoes for many years; but, notwithstanding this fact, so-called Barbadoes aloes are still an article of merchandise and barter. When orders are received for Barbadoes aloes, Curaçoa aloes are invariably supplied.—Amer. Drugg., Mar. 24, 1902, 161.

IRIDEÆ.

Wild Saffron—Abundant Occurrence in the Crimea.—Attention has been directed to the occurrence of wild saffron on uncultivated fields in the Crimea in such profusion that fields appear perfectly violet during the flowering period, which extends throughout the autumn until frost sets in, and that this wild crocus may replace the cultivated perfectly, there existing no difference in appearance, color, taste or odor. The stigmas of the wild saffron are somewhat smaller than those of the cultivated, but this difference does not affect its value. While this wild saffron has hitherto not been collected, it is pointed out that its collection may prove profitable, and that good saffron from this source may be supplied at two-thirds to one-half the price of the cultivated.—Pharm. Centralh., July 11, 1902, 433; from Chem. Ztg., 1901, Rep. 140.

HAEMODORACEÆ.

Lachnanthes Tinctoria, Ell.—Botanical Description and Medicinal Uses.—E. M. Holmes gives a description of the principal botanical characteristics of *Lachnanthes tinctoria*, Ell., a plant indigenous to the swamps and pine barrens of the North American coast from Massachusetts to Florida. This plant, originally employed in homeopathic practice, has recently attracted considerable attention as a remedy for consumption,

the part of the plant recommended being the rhizome, which is slender, wiry, and of a red color with sheathing scales at intervals; 1 to 2 mm. in diameter, 1 to 2 inches long, and presenting in fresh pastures a resinous appearance and red color with scattered white dots representing the vascular bundles. This form of the drug is however not obtainable in English commerce, the entire plant, in flower or in fruit, being supplied in the present form. A description of the plant, leaves, flowers, fruit and seeds is given, accompanied by cuts in illustration; but the author mentions that the plant is described and illustrated also in Britton and Brown's "Illustrated Flora of the Northern United States," under the name

Gyrotheca capitata, Salisb., and that, according to Britton, this is the proper name of the plant.—Pharm. Journ., Feb. 8, 1902, 103.

AMOMEACEÆ.

Cameroon-Cardamoms — *Description*. — Niederstadt describes cardamoms from the German colonies in East Africa as being slender bottle-shaped fruits, somewhat swollen beneath, long-necked, and ending in a beak-like point. Their color is light to dark brown, the odor not unlike that of Malabar and Siam cardamoms. They are 5 to 6 Cm. long, and average 1.5 Cm. in thickness. The numerous black-brown, sticky, pleasantly-acidulous seeds are united into balls which fill the three cells composing the fruit. The pericarp is composed of an outer coat, followed successively by the pigment layer, transverse cellular, oil- and palisade-tissues. While according to Warburg this variety of cardamoms is identical with the "bastard malegetta," *Amomum Clusii*, Smith, by others the plant yielding the Cameroon cardamoms is believed to be *Amomum angustifolium*. The yield of volatile oil is 1.5 per cent.—Malabar fruits yielding 4 per cent.—and the odor is distinct from that of the official cardamom, reminding of bay-leaf oil, but very much finer. The oil of the Cameroon drug cannot, therefore, replace that of the other cardamoms, but may prove useful in perfumery. The following analytical comparison of the two kinds of oil is given by Haensel:

	Malabar.	Cameroon.
Specific gravity	0.9338	0.9071
Polarization	+ 26	— 23.5
Refractometer number + 25 C.	54.1	62.5
Index of refraction	1.4672	1.4675
Iodine number	123.7	152.1

The Cameroon cardamom oil is far less soluble in 60 per cent. alcohol than the Malabar oil.—Pharm. Centralh., Dec. 19, 1901, 810; from Chem. Ztg., 1901, 924.

tion "aruruta," signifying "aru" = meal, "ruta" = root.—Pharm. Ztg., Mar. 12, 1902, 200; from Ztschr. f. App. Chem., 1902, No. 2.

ORCHIDEAE.

Vanilla—*Natural Formation of Vanillin in the Fruits by Preëxisting Ferments*.—According to the studies of Henri Lecomte, vanilla fruits contain two ferments, one an oxydase and the other a hydrolyzing agent. The latter converts the coniferin present in the fruits into coniferylic alcohol and glucose, the former oxidizes this alcohol into vanillin. The oxydase is present in all the organs of the plant. In the ripe fruit it is chiefly located in the internal parenchyma of the pericarp; consequently, when the "pods" are dipped for a few seconds into hot water at a temperature of 80° C., as is frequently practiced in the process of curing, this inner portion is not heated to a sufficient degree to affect the activity of the ferment, although any germs present on the epidermis are doubtless thereby destroyed. The oxydase is found to be most plentiful in the best kinds of vanilla, such as those of Mexico, Réunion and Seychelles, while the inferior Tahiti vanilla and vanillons contain but little.—Pharm. Journ., Dec. 7, 1901, 640; from Compt. rend., 133.

THYMELEÆ.

Daphne Mezereum—*Characters and Composition of the Oil of the Seeds*.—See *Oil of Mezereum Seeds* under "Organic Chemistry."

LAURACEÆ.

False Coto Bark—*A New Kind*.—In addition to several false coto barks described by C. Hartwich in 1890 and 1899, he now calls attention to another which has recently made its appearance in the Hamburg market. This new false coto bark is evidently derived from a *Laurinea*. It occurs in flat, channeled pieces about 1.1 Cm. thick, of a brown color, smooth externally, sparingly bumpy, the inner surface coarsely striated and somewhat darker than the outer. It has a granular fracture, and a strongly aromatic odor, which is difficult to describe, while the taste is similar, but distantly reminds of cinnamon.—Schwz. Wochshr. f. Chem. u. Pharm., Jan. 11, 1902, 78.

POLYGONEACEÆ.

Polygonum Persicaria—*Constituents*.—P. Horst has determined the following proximate constituents in the herbaceous portion of *Polygonum persicaria*: Water, 10.07 per cent.; ash, 6.53 per cent.; volatile oil, 0.053 per cent.; wax, 1.92 per cent.; tannin, 1.52 per cent.; mucilage and pectous substances, 5.42 per cent.; calcium oxalate, 2.18 per cent.; total nitrogen, 3.97 per cent.; ammonia, 0.31 per cent.; cellulose, 27.61 per cent.; volatile acids, 0.0464 per cent.; sugar, 3.24 per cent.—Pharm. Ztg., Feb. 8, 1902, 108; from Chem. Centralb., 1902, No. 1, 56.

Guatemala Rhubarb—Botanical Source.—C. Hartwich gives a comprehensive macroscopic and anatomical description of a so-called rhubarb from Guatemala, which proved to be no rhubarb at all, but consists of the thickened stems of *Jatropha podagria*, Hook., having some superficial external resemblance to rhubarb.—Schwz. Wchschr. f. Chem. u. Pharm., Jan. 11, 1902, 18.

SCROPHULARIACEÆ.

Digitalis—Percentage of Digitoxin.—Cæsar and Loretz (Geschaefte-Bericht, 1901) assayed 47 lots of digitalis leaves, representing a total of 12,000 kilos, by the method of Keller, Ber. d. Deutsch. Pharm. Ger., 1897, and found them to yield from 0.117 to 0.343 per cent. of pure digitoxin, the average being 0.250 per cent.—Pharm. Rev., Nov., 1901, 514.

Digitalis Leaves—Proposed Test of the Pharm. Helv.—The Swiss Pharmacopœia Commission, after an accurate macroscopic and microscopic characterization of digitalis leaves, gives the following test: 10 Gm. of the clear infusion of the leaves, mixed with 3 Cc. alcohol in a separating funnel, are shaken out with chloroform. The chloroform is evaporated, the residue dissolved in 4 Cc. glacial acetic acid, a trace of ferric chloride solution is added, and the solution superimposed on a layer of conc. sulphuric acid. At the point of contact of the two fluids a red zone is developed, and above this a blue-green zone.—Pharm. Ztg., Mar. 19, 1902, 220.

Digitalis Leaves and Tincture—Practical Approximate Tests of Quality.—Dr. J. Gordon Sharp, in connection with some interesting remarks concerning the supposed instability of tincture of digitalis, which, by the way, he finds in his experience to be unjustified, suggests the following simple tests which, in his opinion, should go far to establish, approximately at least, the quality of the leaves and the tincture prepared from them. These tests are based upon the fact that digitalis leaves, in common with all living tissues, contain a ferment or enzyme, which, if dried at ordinary temperatures, can be preserved for years, provided it is preserved from damp, while in a moist atmosphere it readily attacks and decomposes any glucosides associated with it in the leaf. Hence, if one found a specimen of digitalis leaves containing an active ferment, one might reasonably conclude that the glucosides were likewise intact. This could be arrived at by the action of the moistened leaves on amygdalin. Dissolve twenty grains of amygdalin in one fluid ounce of water at (37° C.) 90° F. Place in a wide-mouthed bottle in a moderate temperature and set aside as a control specimen. In another bottle dissolve a similar quantity of amygdalin under similar conditions, and add to this specimen 60 grains powdered digitalis leaves. Shake up and set aside at a moderate temperature. Examine both at the end of eight hours. The plain amygdalin solution should show no change, but the specimen to which the digitalis has been added should have a bitter almond odor, and if a piece of glass have a

drop of nitrate of silver solution smeared over it and then laid over the mouth of the bottle, a white film of silver cyanide should appear in five minutes, showing the presence of hydrocyanic acid in the bottle. This might then be followed by a confirmatory test, after the method of Rutherford Hill in another connection. A small quantity of tincture is prepared with 60 per cent. alcohol. Such a tincture should not at once reduce Fehling's Solution, and even after a few minutes' boiling there should not be marked reduction. This test should show that the glucosides were not decomposed. Next, a positive variation of this test might be applied. A given quantity of the tincture might be dried at ordinary temperature, the resultant extract treated with alcohol, boiled in presence of a mineral acid, and tested quantitatively with Fehling's Solution. By this means a good working rule could be established. Of course, a quantitative analysis with Fehling could not give the amount of digitoxin, because it is not a glucoside; but where a fair glucosidal test was obtained, a corresponding proportion of digitoxin might safely be assumed.—Pharm. Journ., March 22, 1902, 236.

Verbascum Sinuatum, L.—*Saponin Constituent of the Fruits*.—L. Rosenthaler has subjected the fruits of *Verbascum sinuatum*, L., to chemical examination, the interest centering in determining the substance to which the poisonous effect of the fruits on fish is attributable. His results point to a saponin as being the poisonous constituent, which he has obtained pure to the amount of 5.8 to 6.4 per cent. from the air-dried fruits by methods circumstantially described. Purified by means of magnesia after the method employed by Green for preparing and purifying chamelirin from *Chamelirium luteum*, Gray (see Proceedings, 1878, 189).

Verbascum-saponin was obtained in a pure white condition, amorphous, and retaining its whiteness when heated to 120°. It is distinguished from most of the other saponins by its ready solubility in cold absolute alcohol, and by the fact that it is not precipitable from its solutions either by baryta water or by basic lead acetate. In all other respects it has properties in common with saponins in general. Analysis leads to the formula $C_{17}H_{26}O_{10}$, which corresponds with the formula that has already been established for several of the saponins. Experiments made to determine the presence of an alkaloidal constituent in the fruits by the method of Stas-Otto, were in the negative. Nor could he find any evidence of either alkaloid nor saponin in the fruits of *Verbascum phlomoides*, L., the seeds of *V. nigrum*, L., and the seeds or flowers of *V. thapsus*, L., nor in the fruits of several other Scrophulariaceæ, namely: *Paulownia imperialis*, S. et Zucc; *Gratiola officinalis*, L., and *Antirrhinum majus*, L.—Arch. d. Pharm., 240, No. 1 (Jan. 17, 1902), 57-69.

SOLANACEÆ.

Solanum Chenopodium, F. Mueller—*A Reputed Austrian Remedy for*

Dysentery.—E. M. Holmes has identified a plant sent to the Museum of the Brit. Pharm. Society from Boulia, Queensland, where it has a reputation as a remedy for dysentery, to be *Solanum chenopodium*, F. Mueller, the leaves, berries and stalks of the plant being made into an infusion and drunk, with almost immediate benefit to the patient, according to the statement made by Dr. E. B. Ormerod. The identification was made by comparison of the excellent specimens of leaf, flower and fruit with the plant at the Kew Herbarium. The

Chemistry of Solanum Chenopodium was the subject of investigation by C. Edward Saye, his results being based upon small quantities of the leaves and stalks together with a few fruits. In the leaves and fruits together, besides 2.39 per cent. petroleum ether extract, 14.0 per cent. alcoholic extract and 12.57 per cent. of ash, the presence of 0.15 per cent. of alkaloid was determined. The stalks contained 0.07 per cent. of alkaloid with 3.75 per cent. alcoholic extract and 3.4 per cent. of ash. The alkaloid was determined to be *solanine*. No evidence of atropine was obtained by submitting the alkaloid to the color test for that substance, nor to its characteristic reaction, while the presence of solanine was confirmed by the evidence of glucose on subjecting the alkaloid to hydrolysis with hydrochloric acid.—Pharm. Journ., Mar. 1, 1902, 174.

Belladonna—Pharmacopœial Limit of Alcohol.—Lyman F. Kebler maintains that a lower limit of alkaloidal content should be required for both belladonna root and leaf. The following results taken at random from the author's notes indicate what can be expected: Belladonna leaves, with hæmatoxylin as indicator and direct titration, gave 0.353 per cent., 0.355, 0.348, 0.32, 0.337, 0.38, 0.438, 0.358, 0.416, 0.42, 0.43, 0.44. With cochineal the results are always higher. The moisture in the above samples varied from 6 to 9 per cent., and the percentage of alkaloids reported above is based on the anhydrous article. With belladonna root, direct titration and cochineal as indicator, the following results were obtained: 0.546 per cent., 0.91, 0.728, 0.52, 0.514. The average percentage of moisture was 6 per cent. From the above results it can readily be seen that a requirement of 0.35 per cent. for belladonna leaves, and cochineal as indicator, and direct titration, can easily be made. For belladonna root, under the same conditions, 0.45 per cent. should be the lowest limit.—Amer. Drugg., April 28, 1902, 215.

Belladonna Leaves—Assay of Commercial Samples.—Robert C. Purcell and W. R. Graham have determined the total alkaloid in nine parcels of apparently very fine belladonna leaves, all of which proved to contain much less alkaloid than is adopted by manufacturers as a standard = 0.35 per cent. Eight of them contained from 0.10 to 0.14 per cent., and one 0.22 per cent.; average 0.13 per cent.—Proc. Pa. Pharm. Assoc., 1901, 194.

Mandragora Root—Chemical Constituents.—Reviewing the work of Wentzel, Thoms, and others, O. Hesse finds that the total alkaloidal content of the mandragora root examined was 0.417 per cent. The base present in greatest quantity was hyoscyamine. Accompanying this are hyoscine, $C_{17}H_{21}O_4N$, pseudo-hyoscyamine, $C_{17}H_{23}O_3N$, and mandragorine, $C_{15}H_{19}O_2N$. The alkaline liquid from which the bases were shaken out with ether contained scopoletin. Hyoscine was isolated as the hydrobromide from the bases precipitated by $NaHCO_3$. Pseudo-hyoscyamine was found in the mother liquor after this precipitation. Its hydrobromide does not crystallize from alcohol. The gold salt $C_{17}H_{23}O_3N.HAuCl_4$ melts at $174^\circ C$. Mandragorine was isolated by precipitating the mother liquor of pseudo-hyoscyamine with $NaOH$. It occurs as an oily, strongly alkaline base. On decomposition it forms atropaic acid, and another base which crystallizes with difficulty. Its aurichloride, $C_{15}H_{19}O_2N.HAuCl_4$, melts at $124-126^\circ C$.—Pharm. Journ., June 27, 1902, 550; from Chem. Centralb. [2], 72, 1,016.

Mandragora Root—Substitution by the Rhizomes of Scopolia Carniolica. Jacq.—Gehe & Co. (Bericht, April, 1902), state that genuine mandragora root has not been obtainable on the market for a number of years. A recent shipment as such from Trieste consisted of the rhizomes of *Scopolia carniolica*, Jacq., which is distinguished from the true mandragora by greater or less abundance of cup-shaped depressions, remaining from the bud-appendage. The genuine mandragora is a smooth, usually bifurcated, rarely single root, without lateral branches, such as are frequently found on scopolia roots.—Pharm. Ztg., May 10, 1902, 365.

Henbane—Method of Assay.—In working out a method for the assay of henbane leaves, G. Fromme found that the highest and most concordant results were obtained when the alkaloid was liberated with calcium hydroxide. Sodium hydroxide and sodium carbonate seemed to cause a decomposition of the alkaloid. The method consists in shaking frequently during half an hour a mixture of 7 Gm. of henbane, in moderately fine powder, 70 Gm. of ether, and 7 Gm. of milk of lime (1:10). Then 50 Gm. are filtered off, evaporated on a water-bath to one-fourth its volume, poured into a separator, and the transfer completed with a little ether. The ethereal solution is then shaken out with 50 Cc. of $\frac{N}{100}$ acid, this filtered into a flask, and the residual ether washed twice with 5 Cc. of water to remove all the acid, this being also filtered into the flask. In this solution the excess of acid is then determined with $\frac{N}{100}$ alkali, iodeosin being used as indicator after the method of the Pharm. Germ. Chloroform-ether may be used with equal advantage in place of ether in this process.—Pharm. Rev., Dec., 1901, 553; from Cæsar & Loretz's Geschäfts-Bericht, 1901.

Tobacco—Presence of Paraffins in the American Leaf.—T. E. Thorpe

and J. Holmes have extracted from tobacco by means of petroleum ether two paraffins, *hentriacontane*, $C_{31}H_{64}$, melting at 67.8–68.5 C., and *heptacosane*, $C_{27}H_{56}$, melting at 59.3–59.8° C., which are present in the leaf in about equal amounts to the extent, in the aggregate, of rather more than 1 part per 1000. In Kentucky and Virginia leaf, the mixed hydrocarbons, in three separate preparations, had the following melting points: western leaf, 63.0–63.8°; “wrappers,” 63.5–64.0°; “fillers,” 63.7–65.0°. The authors are of opinion that the snow-white substance of satiny lustre extracted from Kentucky tobacco by Kissling which he found to melt at 63.0° C. and regarded as probably an impure *mellissyl mellisate*, and the substance of similar appearance found by him among the constituents of tobacco-smoke, melting at 64.5° C., but which he regarded as hydrocarbon, are in reality the same products, and identical with the mixture of the two paraffins, the heptacosane, $C_{27}H_{56}$, and hentriacontane, $C_{31}H_{64}$, of Kraff, which the authors have found to be present in all the American tobaccos examined by them.—Pharm. Jour., July 21, 1901, 62; from Proc. Chem. Soc., 17, 170.

Nicotine-free Tobacco—Advantages over the Natural Drug.—Hirschberg reviews different methods that have been proposed for removing the nicotine from tobacco or from tobacco smoke before it is inhaled, and records experiments made with tobacco, in form of cigars, which was treated by the method proposed by Prof. Gerold several years ago. This consists in saturating tobacco leaves with a solution of tannin, which neutralizes the nicotine and is said to render it innocuous. The observations were made on healthy young men who smoked cigars made from natural leaves and such made from the treated leaves. Under the use of the latter there was no observable change in the feeling of comfort, frequency of the pulse or blood pressure; whereas, when they smoked cigars made from the natural leaves, there was a diminution of the blood pressure and a lessening of the pulsation plainly demonstrated. Similar effects were observed on animals exposed to the influence of smoke from the two kinds of tobacco.—Schw. Wchschr. f. C. and Ph.

Tobacco Smoke—Bactericidal Properties.—E. Dunan finds that tobacco smoke undoubtedly possesses the property of checking the action of certain microbes found in the human mouth. The bacilli of diphtheria and staphylococci are invariably killed when brought in contact with it, while the development of the bacilli of tuberculosis and of influenza is markedly retarded by its influence. No marked action, however, is observable in the bacteria of tetanus, or the typhoid bacillus, or on streptococci.—Pharm. Journ., July 20, 1901, 61; from Bull de Pharm. de Sud-Est., 6, 193.

Capsicum Fruits—Percentage of Ash in Different Sorts.—Walter H. Lenton has made ash determinations on several samples of *Capsicum*

minimum procured by Mr. Wallis for his histological examination (which see), and representative samples of *Capsicum annuum* fruits, etc., with results as follows :

	Percentage Loss on Drying in Water Oven.	Percentage Ash on Air-dry Drug.
1. <i>Capsicum minimum</i> , bright Nyassaland chillies..	8.4	4.7
2. <i>Capsicum minimum</i> , Sierra Leone. Good, nearly free from stalk.....	8.0	4.4
3. <i>Capsicum minimum</i> , bright Zanzibar.....	7.4	5.1
4. <i>Capsicum minimum</i> , dull, inferior Zanzibar	9.7	5.8
5. <i>Capsicum annuum</i> , average sample Bombay chil- lies.....	9.4	5.4
6. <i>Capsicum annuum</i> , good sample, yellow Coconada	9.1	5.0
7. <i>Capsicum annuum</i> , good average Bombay capsic- cums	10.0	5.6
8. <i>Capsicum annuum</i> , dull, poor	10.4	5.9
9. Japanese capsicums. Good average.....	9.6	4.3

These results do not show any very wide variation either when the ashes of *Capsicum minimum* are compared amongst themselves, or when compared with those of *Capsicum annuum*, and it does not appear possible to distinguish the "annuum" from "minimum" by this means; nor is there sufficient difference in these figures to hold out any prospect of being able to distinguish the poorer qualities of the drug from those of a higher grade.—Pharm. Journ., Nov. 16, 1902, 553.

Chillies and Capsicums—History and Anatomy of the Fruits, Cultivation, Commerce and Uses.—An interesting account of chillies and capsicums, embracing the botanical study of the genus capsicum, the history and anatomy of the fruits, their cultivation and the modifications produced by it, their commerce and uses, is given in a thesis recently published by Guillard. The study of the botanical characters of this genus leads the author to concur in the opinion that the numerous species and sub-species are all originally derived from two, viz., *Capsicum annuum*, L., and *C. fastigiatum*, Bl. Having selected the fruits of

Capsicum annuum for detailed investigation of the structure of capsicum fruits, the author's studies are of particular interest in connection with the investigations of *Capsicum minimum* of Wallis, an account of which is given in the preceding paper. His investigations are, however, not carried out with the same minuteness as those of Wallis. He compares the histological and anatomical character of *C. annuum* fruits with those of *C. minimum*, pointing out differences in the hypodermal layers of the pericarp and in the transverse section of the thickened cells of the seed coat, but concludes with the observation that the powders of the two drugs are identical. A lengthy description and enumeration of the species, etc., of the

ple diminishes in proportion as the size of the fruit increases until it finally disappears, but the minute structure remains unaffected. The thesis is preceded by a historical introduction, concludes with a short account of the commerce and uses of the drug.—Pharm. Journ. Feb. 8, 1902, 102.

Capsicum Minimum—Histological Distinction from Capsicum annum. T. Edward Wallis mentions that notwithstanding that the fruits of *Capsicum minimum*, known on the market as "chillies," have always been official in the B. P., and the powdered drug as sold has been largely adulterated, no thorough histological investigation of the drug has been published in recent years, and he has therefore undertaken this task with the object of supplying the deficiency. The fruit occurs in the market in several varieties—Sierra Leone, Zanzibar, Nyassaland, &c.—but the bulk of the chillies of commerce are obtained from Zanzibar, and this variety was therefore selected for examination. The fruits of *Capsicum minimum* have a thin, papery, dull orange-red pericarp 10 to 20 Mm. long and 5 to 7 Mm. in diameter in the widest part. Their shape is ovoid-conical with an obtuse apex. Zanzibar chillies have usually the stalk and calyx attached, the length of the calyx and stalk being from 20 to 30 Mm. The fruit is divided longitudinally into two cells by a very thin papery dissepiment, to which are attached from seven to fifteen small, flat, yellowish seeds. A capsicum fruit, therefore, presents four distinct parts, the anatomy of each of which has been carefully studied and examined by the author for diagnostic features, these parts being: (1) The pericarp, including the dissepiment; (2) the seed; (3) the calyx; (4) the stalk. All of these are carefully described, the histological elements being illustrated by numerous cuts, as is also the histological description of the powdered drug. By comparing the anatomy of *Capsicum minimum* as revealed by the author's very exhaustive study with the accounts of the histology of *Capsicum annum* published by Vogl, Hanauseck, Tschirch, Oesterle, and others, certain differences are pointed out by Mr. Wallis, which he considers useful to enable one to distinguish between the powders of the two drugs. The chief points of difference are as follows: (1) The outer epidermis of the pericarp of *Capsicum minimum* is formed of thick-walled cells which have few pits, are arranged frequently in small groups of five to seven in a row, and whose walls show four lines in their thickness. The cuticle is delicately striated. The corresponding epidermis of *Capsicum annum* shows rounded and much thickened cells with numerous pits in the walls, and not in any way disposed in groups. (2) The tissue lying immediately beneath the outer epidermis of the pericarp of *C. minimum* is formed of delicate thin-walled cellulose parenchyma, while in *C. annum* there is a well-defined collenchymatous and sutorized hypoderma. (3) The large much-thickened cells from the epidermis of the seed-coat of *C.*

minimum show curious club-shaped processes when isolated, and when seen from the side they exhibit oval or rounded slits extending about one-third the distance from the outer wall. The heaviest thickening is at the base, and no circular or pit-like marks, as are represented in drawings of *C. annuum*, can be seen when the cells are viewed in surface; a slight wavy striation is, however, visible. Judging from the published figures, the corresponding cells of *C. annuum* are much shallower, and have a more contorted thickening when seen from the side. These characters are sufficient to enable one to state whether a given sample of cayenne pepper is derived from *C. minimum* or not.—Pharm. Journ., Nov. 16, 1901, 552-557.

ACANTHACEÆ.

Peristrophe Angustifolia, Nees—*A New Cumarin Plant*.—H. Molish calls attention to a new source of cumarin in a Javanese plant, *Peristrophe angustifolia*, Nees, fol. var. The plant is frequently cultivated in hot-houses, but the living plant appears to be devoid of odor, whereas the dried plants possess a strong odor of cumarin. Applying a process somewhat modified after Neesler's method, he succeeded in subliming the characteristic cumarin crystals from the dried plant. He attributes this post-mortal development of cumarin to the action of a ferment, after the manner in which bitter almond oil is developed by the action of emulsin upon amygdalin, but does not mention the glucosidal constituent from which the cumarin is presumably produced.—Pharm. Ztg., Mar. 12, 1902, 200; from Ber. d. D. Bot. Ges., 1901, No. 19, 530.

OLEACEÆ.

I'Sano Oil—*A New Purgative Oil from Tropical Africa*.—A. Hubert has reported to the "Académie de Médecine" on the characters, chemical composition and properties of a purgative oil, i'sano oil, derived from the fruit of an oleaceous tree indigenous to tropical Africa and abundant in the neighborhood of Brazzaville. The fruit is an ovoid drupe, over three Cm. in length, almost entirely filled with a brownish kernel, which yields on pressure 60 per cent. of oil. From this the author has isolated a new fatty acid, isanic acid, $C_{14}H_{20}O_2$, in the form of foliaceous crystals, melting at $41^{\circ}C.$, very soluble in strong alcohol, ether, chloroform and benzene, also in alkaline solutions, from which it may be separated in the form of crystalline salts. It acts as a powerful purgative, and is considered to be the active principle of the oil. The acid and its salts are very unstable, rapidly absorbing atmospheric oxygen, and becoming deep rose-colored on exposure to the air.—Pharm. Journ., Feb. 15, 1902, 121; from L'Union Pharm., 41, 12.

Olive Oil.—C. F. G. Meyer, Jr., has written a brief review of the principal facts concerning the growth and cultivation of the olive tree, the

LABIATÆ.

Peppermint—Influence of Fertilization on the Development of the Plant and Oil.—In continuation of their previous examinations (see Proceedings, 1901, 809) E. Charabot and A. Hébert have studied the influence of fertilization with common salt on the development of the peppermint plant. They found that from a certain stage in the development, the water-content of the plant diminishes, and the content of organic substance is thereby increased, no matter whether the plant developed normally, or under the influence of the salt; but in the latter case the changes are much greater. With regard to the oil produced by the plant, it was found that when the development of the plant progressed normally, the content of menthol esters increased, but that the menthone diminished. Chloride of sodium promotes the process considerably, but in spite of this it retards the development to such an extent that the yield of ester per acre is less than is the case where the plant has developed in a normal manner. The investigators, however, quote only the results of one experiment as a proof of their observations.—Schimmel's Rep., April, 1902, 54; from Compt. rend., 34 (1902), 181.

Peppermint Cultivation—Effect of Sodium Nitrate.—In continuation of their investigation on the influence of certain fertilizers on the development of essential oil in peppermint, E. Charabot and A. Hébert have studied the effects of sodium nitrate on the secretion of the oil. They find that, like sodium chloride (see above), the application of a 1.40 solution of NaNO_3 once, early in the season, causes a marked increase in the amount of esters in the peppermint oil obtained from the crop, a lessening of the quantity of water in the herb, and a corresponding increase in the amount of organic matter. While the proportion of esters in the oil is increased by this treatment, the relative quantity of menthol and of menthone is diminished.—Pharm. Journ., June 28, 1902, 549; from Comptes rend., 134, 1228.

Mints—Cultivation in Russia.—Some interesting information concerning the cultivation of peppermint (*Mentha piperita*) and curled mint (*M. crispa*) in the Russian province (government) of Tula is communicated to "Farmaz. Journ." (1901, 261.) Both plants are cultivated and the oil distilled from them, but preference is given to curled mint because its cultivation requires less attention and possesses other advantages. For this purpose the best garden soil is selected, it is strongly manured, with horse dung preferably, and frequently and deeply ploughed before setting out the plants, this being done from the middle of May to the middle of June, the harvesting being done in August. The mint-beds are protected in

winter with straw, the plants being renewed only when they fail to reproduce. After cutting the mint it is allowed to wilt and brought to the stills which are either rented or where it is sold by the small producers. These stills are often quite primitive in construction, consisting of a curved iron kettle provided with an exit tube attached to a worm condenser or, quite frequently, simply a straight tube. Nevertheless, the stills are sufficiently large to yield from $1\frac{1}{4}$ to $1\frac{1}{2}$ pounds of oil from a single charge. The quantity of the oil depends, of course, on the character of the soil producing the plants as well as on the care in conducting the distillation. The yield of oil from curled mint is about 0.3 per cent; from peppermint only 0.12 per cent.—Pharm. Ztg., July 13, 1901, 562.

Collinsonia Canadensis—*An Alkaloid the Active Constituent*.—Herman J. Lohmann has isolated from the root of *Collinsonia Canadensis* (stone root) a crystalline alkaloidal substance which he believes to be an active principle of the drug. He describes some of its chemical characters, which seem to prove its basic properties and ability to form with sulphuric, hydrochloric and nitric acid well defined crystalline salts. Physiological tests made point out that the diuretic properties of stone root are due to this alkaloid, while the irritant effects of the drug are attributable to the resin contained in it.—Proc. N. J. Pharm. Assoc., 1901, 61–68.

Collinsonia Canadensis—*Magnesium Phosphate the Crystalline Constituent*.—In view of the imperfect process described by H. J. Lohmann for preparing the “alkaloid described in the foregoing paper,” H. M. Gordin, after carefully following Mr. Lohmann’s directions and obtaining “beautiful colorless crystals,” subjected these to the usual tests for alkaloids, and to other tests, which prove them to be, not an alkaloid, but simply “magnesium phosphate.”—Drug. Circ., Feb., 1902, 29.

BORRAGINEÆ.

Cordia Excelsa.—Identity of the so-called *Cordianine* of von Peckholt with *Allantoine*, which see under “Organic Chemistry.”

Kalahmet Wood—*Two Sorts from Distinct Plants*.—E. M. Holmes calls attention to the apparent fact that two woods go under the name of kalahmet in commerce in Burmah, the one, which is represented in the Museum of the Pharmaceutical Society of Great Britain, being the wood of an undescribed species of *Santalum*, the other derived from

Cordia fragrantissima. A specimen of the latter having been exhibited at a recent meeting of the society named, by Sir Dietrich Brandis, Dr. Holmes called his attention to certain distinctions. The former now finds the wood of *Cordia fragrantissima* to differ from the museum specimen of kalahmet wood in several particulars—having broad medullary rays consisting of three to six rows of cells, very conspicuous on a radial section, and giving the wood a beautifully mottled appearance. The vessels are

large and mostly isolated, 0.2 mm. in diameter, and numerous cross-bars of wood parenchyma connect the medullary rays. The heartwood is of a distinct brown color. The tree, the true *Cordia fragrantissima*, was found by Sir D. Brandis near the village of Oubo, and again in the Paunglin forests of Pega. He finds that in the museum specimen of kalahmet wood the medullary rays are slender and uniform, consisting only of one or two rows of cells, numerous and equidistant, and the vessels are small, only 0.05 in diameter. He believes it to be the wood of a *Santalum*, allied to *Santalum album*, from which it differs in the longer medullary rays, and in the vessels not being solitary, as they are in the latter species, but often in radial lines of two to five. Moreover, the dark olive color of the wood is very different to that of *Santalum album*.—Pharm. Journ., Nov. 16, 1901, 552.

CONVOLVULACEÆ.

Jalap—*Percentage of Resin*.—John C. Umney has determined the percentage of washed resin from thirteen samples of jalap, representing the drug as it occurs at present in the English market, with the following results: 6.0, 8.2, 8.0, 6.7, 8.7, 5.4, 11.3, 6.2, 18.4, 9.6, 7.3, 6.4 and 6.5 per cent.—the average of these samples being 8.3 per cent. The B. P., 1898, requires 9 to 11 per cent.; the U. S. P., 1890, 12 per cent.; the Germ. Ph., 1900, 9 per cent. (that of 1890, only 7 per cent.); while the French Codex, 1884, requires 16 to 18 per cent. It has been suggested (Flückiger, 1890) that the low percentage of resin in jalap is due to the partial extraction of the tubers in Mexico. An examination of the tubers yielding only 5.4 per cent. of resin failed to show that they had been treated by any solvent. They were exceedingly small, with a pale exterior, starchy, and obviously immature. The author is evidently of the opinion that the quality of jalap depends upon the condition of cultivation and collection. While the demand of the French Codex is unreasonably high, that of the B. P., 1898, is within reasonable limits, and efforts should be made to so improve the conditions of cultivating and collecting the tubers, that the B. P.'s standard may be if possible maintained. From information gained from one of the oldest London drug brokers, it appears that the tubers are collected at any time during the dry season, from the middle of November to March.—Trans. Br. Pharm. Conf., 1901, 332-338.

Jalap—*Improved Method of Assay*.—G. Weigel recommends the following method for the assay of jalap as yielding more accurate results than the methods of the Germ. Pharm., IV.: 5 Gm. of the powdered drug are intimately mixed with about the same volume (corresponding to four times the weight) of washed and coarsely sifted river sand. The mixture is introduced into an extraction tube and treated in a Soxhlet apparatus with about 60 Gm. of 96 per cent. alcohol on a water-bath for from one to three hours. The extract is filtered, the extraction flask and filter being

washed with a little alcohol, and the filtrate and washings are carefully evaporated to dryness on a water-bath. The residue is then washed twice or thrice by digesting with 33 Cc. of hot water, the water being decanted each time after cooling, and the residual resin is finally dried in a drying closet and weighed. The process may then be completed in a few hours, whereas the methods usually described require several days. The author furthermore finds that the quality of commercial jalap has not depreciated, that there is no difficulty to obtain the drug containing the required percentage of resin.—Pharm. Centralh., Feb. 20, 1902, 103.

Calystegia Soldanella—*Micro-Anatomical and Chemical Investigation*.—Benlaygen has examined the anatomical structure of the soldanella and finds that, in addition to the common secondary wood- and bark-elements and the inner-bark elements, characteristic of the convolvulaceæ, all the tissues of the plant were pervaded with numerous secretory vessels. Starch was present in the bark and pith of the rhizome. The chemical investigation of the plant revealed besides the ordinary plant constituents, such as tannin, salts, starch, etc., small quantities of glucose, 0.94 per cent. of oil, 1.63 per cent. of fat, and 12 per cent. of resin, the purgative properties of the plant being dependent on the latter. The pure resin was obtained from the drug (rhizome ? Rep.) by extraction with alcohol, concentration to syrupy consistence, and precipitation in water and repeated resolution in a little alcohol and precipitation in a large quantity of water. It is amber colored, has an acid reaction, is pleasantly odorous, melts at 113° C., and is easily soluble in alcohol, ether, chloroform, and acetic acid. With mineral acids it gives a red color, with nitric acid a yellow. The adult purgative dose of the resin is 1.5 Gm., that of the powdered drug being 3 to 5 Gm.—Pharm. Ztg., Oct. 23, 1901, 849; from Rep. de Pharm., 1901, No. 9, 393.

APOCYNACEÆ.

Ipoh—*Arrow Poisons*—*Components*.—C. Hartwich and P. Geiger briefly enumerate the plants which, in addition to the latex of the ipoh-tree, *Antiaria toxicaria*, Lerch, are employed in one or the other of the arrow poisons employed by the natives of southeastern Asia. The list is so formidable that it cannot be reproduced here, one or more species being mentioned in 23 families. The authors have examined 25 different arrow poisons and find only two in which the characteristic toxic constituents of *Antiaria toxicaria*, namely, ipohine and antiarine, are not present. They have found in these 25 arrow poisons, the physical character of their occurrence being carefully described, the following toxic constituents: *Derrid*, the toxic constituent of *Derris elliptica*, twice; *brucine*, five times; *strychnine*, eleven times; *ipohine*, twelve times, and *antiarine*, twenty-one times. These investigations, which are published in detail in a recent volume written by one of the authors (P. Geiger) will doubtless prove of great

historical value in the future, since the use of arrow po being replaced by explosives. It is interesting here to single exception, the arrows poisoned with the latex of th not propelled by means of the bow but by means of the somewhat difficult to define the territory in which the ip used, but it is about as follows: The line begins westward Islands, passes around the northwestern point of Sumatra Malayan peninsula and a portion of Hinder-India, and is l ern border. It embraces also a considerable portion of from here between the Islands of Catawian and Palawan and the Philippines, in a restricted sense, on the other, th component of the arrow poisons used in the latter region of *Lunasia philippinensis*, Planchon. Thence the line em Timor, Sumba, and runs out and returns to the Mentawai d. Pharm., 239, No. 7 (Sept. 17, 1901), 491-506.

Strophanthus—The Probable Spear Poison of the Native and Monchi County.—Frank Charteris has examined the po tation on some poisoned spears presented to the Departm Medica of Glasgow University by Mr. Craster, principal me the Niger Territories. Death had resulted from a stab i one of Mr. Craster's men in a few minutes after its inflictio gagement with the natives on the Upper Benne River. A of the greenish mouldy scrapings, 1 : 1000, proved to be hig By approximate treatment described, a small quantity of crystalline substance was isolated, which was capable of prod rabbits in quantities of 1.6 Mgm. Chemically, the substanc be a glucoside, and answered most of the chemical tests for hence it is highly probale that the spears were poisoned with —this view being supported by pharmacological action of Pharm. Journ., July 13, 1901, 43.

Strophanthus—Precaution in Applying the B. P. Color Holmes, having his attention called to the official color test thus by the fact that some correspondents complained of some difficulty in getting the dark green color with seeds th fied as genuine, was led to experiment with the seeds himsel prise, the same acid which he had used for some months n the green color with genuine seeds. Further experiments fact that the acid had become weaker, by absorbing water, acid containing 8 parts of sulphuric acid (B. P.) and 2 parts necessary to insure a proper reaction. He therefore recomm words "sulphuric acid" should be replaced by "a freshly p tion containing eight parts of sulphuric acid and two of distil future editions of the B. P. Furthermore, he calls attentio tion, made to him by Mr. O. A. Elias, that those who find

cut a thin transverse section of the seed may blanch the seed as is done with almonds, and thus remove the seed coats. The blanched seed in acid of the strength mentioned speedily shows a very dark green line around the margin, which gradually extends over the whole surface, the acid becoming of a dirty yellowish green tint.—Pharm. Journ., March 29, 1902, 254.

Nux Vomica—Presence of Copper as a Natural Constituent.—Referring to a previous paper in which he traced the greenish-blue coloration of a mixture containing tincture of nux vomica and aromatic spirit of ammonia to a small percentage of copper in the tincture, and the subsequent detection of copper in powdered nux vomica (see Proceedings, 1900, 596), J. Rutherford Hill mentions that Mr. David Hooper, of Calcutta, having examined some nux vomica fruits from Mysore and found the seeds to be free from copper, he has since examined some fresh fruits procured for him by Mr. Alexander Meldrun, of Calcutta, from the Calcutta Botanic Gardens, and has obtained undoubted evidence of the presence of copper in the seeds. He further mentions that, as his experiments have shown, it is very easy to miss a small trace of copper in a seed unless one is on his guard. Without a knowledge of the exact method employed by Mr. Hooper, the dictum of the latter therefore requires qualification, and the original statement of Meissner that nux vomica seeds naturally contain copper may be accepted as accurate.—Pharm. Journ., April 26, 1902, 343.

Gelsemium—Microscopic Description.—Prof. L. E. Sayre contributes the results of a special study of the microscopic characters of the root and rhizome of *Gelsemium sempervirens*, undertaken for the purpose of clearing up some ambiguous and misleading structural descriptions now given in the U. S. P. The paper may be consulted in Drug. Circ., Dec., 1901, 244-245.

Condurango—Medicinal Value.—In response to a query concerning the medicinal value of condurango bark, Prof. P. E. Hommell contributes a review of the subject from the literature, from which it appears that much of our present knowledge concerning this drug, both as to source and medicinal value, is quite problematical. It is generally assumed to be the bark of *Gonolobus Condurango*, but Ayers has pointed out that there are at least ten different shrubby vines that contribute to the drug which in Peru is known as "condurango blanco." The records concerning the medicinal value of the drug are quite as indefinite.—Proc. N. J. Pharm. Assoc., 1901, 64-66.

Oleander Leaves—Medicinal Use and Poisonous Character.—Dr. Wateff, referring to numerous cases of illness produced by inhaling the perfume of oleander flowers, calls attention to the popular use, in Bulgaria, of decoctions of oleander leaves for promoting menstruation, and also for produc-

ing abortions. This use is frequently attended by toxic effect, which manifests itself by nausea, vomiting, headache and reduction of the pulse.—Pharm. Centralh., Dec. 19, 1901, 810; from D. Med. Wchschr., 1901, 801.

STYRACEÆ.

Storax—*Proximate Examination of the Different Sorts*.—A. Tschirch and L. v. Itallie, in a series of papers on Vegetable Secretions, communicate the results of their studies of Oriental and American storax, and of the allied resinous secretion of *Altingia excelsa*, Noronha (*Liquidambar altigiana*, Bl.), known under the name of “rasamala resin.” After a review of the chemical history and a detailed account of their own experiments and investigation, their conclusions concerning the proximate constituents of each of these resinous secretions are as follows:

Oriental Storax (*Liquidambar Orientale*, L.) is a mixture of free cinnamic acid, vanillin, styrol, styracin, cinnamic acid-ethyl ester, cinnamic acid-phenylpropyl ester and storesinol, partly in the free state and partly as cinnamic acid ester. *Storesinol* has the composition $C_{16}H_{26}O_2$, and is isomeric with the resin alcohol isolated from benzoin, *benzoresinol*, but not identical with it—the melting point of storesinol being 156° – 161° —while that of benzoresinol is 272° C. Storesinol forms a white, odorless powder, which becomes strongly adhesive on trituration. It is soluble in alcohol, methyl and amyl alcohol, ether, acetic ether, chloroform, acetone, carbon-disulphide, benzol, phenol, glacial acetic acid, and in 1 per cent. aqueous solution of potassa or soda, but precipitated from the latter by stronger alkali solutions. It is insoluble in petroleum ether. By the action of sulphuric acid a derivative, *styrogenin*, $C_{26}H_{40}O_{31}$, was obtained, while by the action of hydrobromic and hydriodic acids a crystalline compound of the formula $C_{16}H_{26}O_3$ was obtained. The author also obtained a potassium compound and the monomethylether of storesinol. Quantitatively oriental storax, of good quality, was found to have the following composition:

Insoluble in ether.....	2.4	per cent.
Free cinnamic acid (calculated).....	23.1	“
Water (about).....	14.0	“
Aromatic ester	22.5	“
Styrol and vanillin.....	2.0	“
Resin (storesinol, etc.).....	36.0	“
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	100	

The acid number of this sample was 81.0; the saponification number, 179.0; the ester number, 98.0; and the saponification number of the mixture of esters and styrol, 209. These numbers give a total of cinnamic acid of 47.3 per cent., 23.1 per cent. being free and 24.2 per cent. combined.

American Storax (*Liquidambar styraciflua*, L.) is evidently closely related in its composition with the oriental storax. The odor reminded more of benzoin, however. The author found free cinnamic acid, vanillin, styrol, styracin, cinnamic acid-phenylpropylester, and styresinol, partly free and partly in the form of cinnamic acid ester.

Styresinol is not alone isomeric with storesinol, having the composition $C_{18}H_{26}O_2$, but is practically identical with the latter in all of its properties with the single exception its rotatory power, which is $+52$, while that of storesinol is $+13^{\circ} 30'$.

Quantitatively American storax (sweet gum) obtained from Prof. Mohr, Mobile, Alabama, was found to have the following composition :

Insoluble in ether.....	3.12 per cent.
Free cinnamic acid (calculated)	23.4 “
Aromatic esters (about)	24.8 “
Styrol and vanillin.....	2.0 “
Resin (styresinol, etc.)	45.0 “

The acid number of this sample was 89.3 ; the saponification number, 192.7 ; the ester number, 103.4 ; the saponification number of the mixture of aromatic esters and styrol, 205.1. These numbers give a total of cinnamic acid of 50.93 per cent.—23.4 per cent. being free and 27.53 per cent. combined. The deviations of the two kinds of storax are insignificant, and practically of no consequence, if we leave out of consideration the possible non-identity of the two resin-alcohols, storesinal and styresinol.

Rasamala-Resin (*Altingia excelsa*, Nor.) was obtained in three samples from Java, two of them identical, consisting of loosely adherent pieces, faintly dusty, of a light yellow color and glassy fracture, crumbling to powder when chewed. These are designated as “rasamala bodas” (= white), and are derived from an Alting tree having white wood ; the third sample consisted of a conglomeration of brown resinous pieces, and was designated “rasamala beureum” (= red), derived from a tree having red wood ; but both trees are, according to Greshopf, trees identical with *Altingia excelsa*. The authors used only the light yellow sort for their examination. These two samples melted respectively at 65° and 80° C., this difference being probably due to the variable quantity of volatile oil contained in them. The odor is very aromatic, reminding of cinnamon, pepper and turpentine. The solubilities are as follows : partially, in alcohol, methyl-alcohol, carbon disulphide and glacial acetic acid ; almost completely, in ether, acetic ether, chloroform and benzol ; nearly insoluble, in acetone and soda solution. The only constituents that have been determined with certainty by the present investigations are : cinnamic acid, benzaldehyde and cinnamic aldehyde. It is evident that, notwithstanding the close botanical relation of storax and rasamala-resin, they are widely different in composition. Possibly this difference, however, is due to the

different modes of collection. The tree being abundant and easily accessible in certain parts of Java, it might be worth the experiment to obtain the exudation in a manner similar to that practiced in the collection of storax.—Arch. d. Pharm., 239, No. 7 (Sept. 17, 1901) 506–547.

Storax—Falsification.—F. Evers observes that since the introduction of purified storax into the Pharm. Germ. the crude drug is seldom demanded by pharmacists, but that, owing to the inadequate pharmacopœial description of the purified drug, this is liable to gross falsification. The extent to which this falsification is practiced is shown by the recent discovery in the Hamburg market of 15 barrels of storax, which, according to the author's estimate, contained only about 10 per cent. of genuine storax, the mass being composed essentially of white turpentine, fixed oil and water; while at the date of the author's paper a still larger lot (28 barrels) had found its way into Hamburg which has essentially the same composition as the aforesaid 15 barrels. Indeed, he has met with factitious storax containing no genuine storax at all—being simply a resinous mixture perfumed with a little oil of cinnamon. Furthermore, the demand for a light colored storax is now of frequent occurrence, notwithstanding that this in itself is a characteristic of the factitious drug, genuine purified storax having a dark brown color; all of which points to the necessity of a more accurate and definite pharmacopœial description of this drug. Examinations of genuine purified storax made by the author during the last few years reveal the following constants: Specific gravity at 100° compared with water at 100°, 1.099–1.107; saponification number, 208.7–223.0; acid number, 56.0–67.0; iodine number, 66.2–79.7. As a preliminary, the ammonia test and the shaking-out test with petroleum ether, proposed by the author some years ago, serve a good purpose. In view of the fact, however, that whatever medicinal value may be possessed by both storax and balsam of Peru is due to the *benzyl esters of benzoic and cinnamic acid* (which see under "Organic Chemistry"), these might be profitably prepared and possibly substituted for the balsams with advantage.—Pharm. Ztg., Dec. 21, 1901, 1014–1015.

Siam Benzoin—Limit of Ash and Solubility.—M. Dieterich considers it practicable to require the almost complete solubility of Siam benzoin in alcohol, and that the percentage of ash shall not exceed 1.5 per cent. The Pharm. Germ. IV. admits a limit of 2 per cent. of ash, and 5 per cent. of substance insoluble in alcohol.—Pharm. Centralh., Aug. 1, 1901, 464; from Helf. Annal., 1901.

ERICACEÆ.

Mountain Laurel—Poisonous Properties.—Although the leaves of the mountain laurel (*Kalmia latifolia*) are generally conceded to possess poisonous properties, due to an ericaceous principle, andromedotoxin, the information concerning its poisonous action is rather vague. Prof. H.

H. Rusby now calls attention to some observations that have been made by Ulysses T. Payne on its poisonbus effect upon sheep during the past winter, whose description of the symptoms is regarded as valuable since he is evidently a careful and accurate observer. This seems to indicate that the poison is a stupefying narcotic and a depressor of the motor system, the centers being chiefly affected and the respiration especially suffering. Mr. Payne was advised in future cases to use fifteen minims of the tincture of nux vomica, repeating it twice at two-hour intervals, and afterward less frequently as the symptoms require.—Drug. Circ., Feb., 1902, 27.

COMPOSITÆ.

Eupatorium Rebaudianum—*Remarkable Sweet Constituent*.—Bertoni, director of the agronomic Institute of Asuncion, Paraguay, has recently described and subjected to scientific investigation a plant, occurring in the north of Paraguay, which is characterized by its remarkable sweet taste. It is known by the Guaranis by the names of "caá-hée," "azucá-caá," and "eira-caá," three names signifying respectively sweet, sugar and honey yerba, but has received the botanical name *Eupatorium Rebaudianum*. The plant is insignificant in size and appearance, a few decimeters in height, with small leaves and minute flowers; but a few of the leaves are sufficient to sweeten a cup of tea or coffee, and when placed on the tongue, even a small portion of a leaf imparts a sweet taste that persists for an hour. This intensely sweet taste alone differentiates it from sugar. Moreover, it is evidently incapable of undergoing the alcoholic fermentation, although it remains to be isolated so that its character may be studied.—Pharm. Ztg., Feb. 8, 1902, 108.

Pseudocymopterus Anisatus—*Characters of Volatile Oil*.—I. W. Brandel obtained about 4 Cc. of a light, lemon-yellow volatile oil from a small quantity of a plant collected by Prof. H. W. Hillyer in the mountains at Irondale, Colorado, at an altitude of about 7,500, and identified by Prof. Coulter, of the University of Chicago, as *Pseudocymopterus anisatus* (Gray) C. & R. The oil had a sp. gr. of 0.978 at 20° and an odor strongly reminding of anise; but when exposed to a low temperature it did not congeal, notwithstanding that in its specific gravity it corresponds closely with the oils containing large percentages of anethol. The crystallization of any anethol present may perhaps be prevented by the presence of methyl chavicol, or to some other body present. In the present experiment the entire plant was subjected to distillation. Future experiments are promised with larger quantities of the plant, and particularly with the fruit, if obtainable.—Pharm. Rev., May, 1902, 218.

Insect Flowers—*Anatomical Study of Genuine and False Flowers*.—Eugene Collin has made a very exhaustive and complete study of the botanical, macrocosmic and microscopic characters of the flowers and their powders that yield the genuine, or, as experience has shown, the most

potent insecticides, these being the flowers or flower heads of certain species of *chrysanthemum*, which alone should be supplied by wholesale dealers as insect powders. The principal commercial varieties of insect flowers are three, viz. : Dalmatian, Montenegrin and Caucasian (or Persian). The most important of these is the Dalmatian, which is obtained from *Chrysanthemum cinerariæfolium*, Vis. (*C. turreanum*, Vis., *C. rigidum*, Vis.), a plant indigenous to Dalmatia, Montenegro and Herzegovinia. The cultivated flowers are supplied from Dalmatia, whereas the Montenegrin flowers are the wild-grown. The Caucasian (or Persian) insect flowers consist of flower heads of two closely allied species, *C. roseum*, Bib., mixed with those of *C. carneum*. All of these are very minutely described in a series of three papers, the text being profusely illustrated with cuts showing the botanical and microscopic features of these genuine flowers, the series being concluded by a similar description of the flower heads of *chrysanthemum palleus*, the false insect flower which at the present is used most frequently for adulterating Dalmatian insect powder. As pointed out by Tschirsch, six or seven species of *chrysanthemum*, several species of *anthesis*, and the flowers of *Inula pulicaria*, and of *Tanacetum vulgare*, are employed for falsifying insect powder ; but their list is far more complete, as recently shown by Prof. Gérard, of Lyons. With regard to the genuine species of *chrysanthemum* and of the false species, *C. palleus*, the principal anatomical features that allow of distinguishing between the flowers, are in the false species the following : the size and sinuous shape of the epidermal cells of the liquidate corollas and the absence of the oil-glands from the lower part ; the paucity and smallness of the oil-glands at the base of the tubular corollas ; the deep color and characteristic appearance of the secretory ducts of the ovary ; the characteristic cells of the walls of the ovary, and the shape of the hairs on the bracts. For the detailed descriptions given by the author, the original paper must be consulted in Pharm. Journ., Oct. 26, Nov. 2 and Nov. 30, 1901, 474-477, 503-506, and 601-605.

RUBIACEÆ.

Cinchona—*Historical Notes*.—At the meeting of the Maine Pharmaceutical Association, in 1901, two interesting papers on “Cinchona” were read, the one by J. F. Sanford, giving a brief history of cinchona, the other by E. T. Bowen, giving in addition to a general historical account, an account of the methods of cultivation and collection as practiced in the East Indies, the character of the bark produced, and of the alkaloids found in them. Neither of these papers brings anything that is absolutely new, but the subject is presented in a readable form, and will doubtless be read with interest in Proc. Maine Pharm. Assoc., 1901, 34 to 38, and 41 to 43.

Cinchona—*Cultivation in India and Java*.—During a tour of the world,

Verne had the opportunity to visit and investigate the cinchona plantations in India and Java, the results of his observations, recently communicated in the form of a comprehensive report, constituting a noteworthy addition to the literature on this subject. It is of particular interest that his comparison of the success in cinchona culture is decidedly in favor of the method practiced in Java. As is well known the principal cinchona plantation in British-India are in Sikkim, where, according to his observation, three species of cinchona are cultivated, namely: *Cinchona calisaya*, Weddel (var. *Ledgeriana*, Howard), *Cinchona succirubra*, Taron, and *Cinchona hybrida*. Of these, the var. *Ledgeriana* requires the greatest care in cultivation, but it also affords the highest yield of quinine, which, moreover, is associated with a very small percentage of cinchonine. Here the young plants are set out in rows, 6 feet apart, in March, and yield bark in three years, additional crops of bark being obtained at regular intervals of 3 years until the trees are 15 years old—their average life and usefulness. The average yield of quinine is 4 per cent. from the root-bark, 4.5 per cent. from the stem-bark, and 2.5 per cent. from the bark of the branches, while the yield of cinchonine in all of these barks does not exceed 0.5 per cent. The practice at the Sikkim plantations to manufacture quinine is highly commendable since it enables the utilization of unsightly, broken up, and refuse bark, for which it would be difficult to find a market. The method pursued is that of Dubreuil, modified, and consists in extracting the powdered bark with hydrochloric acid, precipitation with soda, shaking out with petroleum, shaking out of the petroleum solution with the calculated quantity of diluted sulphuric acid, and crystallization by evaporation, etc. In Java greater care is in general exercised in the cultivation and the trees are allowed to reach the age of 12 years before bark is collected. Moreover, the cultivation is confined to the variety *Ledgeriana*. The very handsome bark thus produced, yielding as much as 9 per cent. and occasionally even 14 per cent. of quinine, is exported to Europe, while the broken pieces and the refuse bark is worked up into quinine in a manufacturing plant provided with all the modern appliances. The author concludes from the observations made during his journey, that the cultivation of cinchona in suitable tropical localities should be confined principally to the *Ledgeriana* variety; that the culture of *Cinchona succirubra* should be restricted, and that the culture of all other cinchonas should be avoided; and, furthermore, that quinine factories should be erected in close proximity to the plantations, so that the unmarketable bark and refuse may be speedily converted into quinine.—Pharm. Ztg., Oct. 23, 1901, 847; from Les Nouv. Rem., Sept. 8, 1901.

Cinchona—Cultivation on the Bengal Plantations.—The following details concerning the cultivation of cinchona in Bengal during the years 1899–1900 are given in a recent report of Major D. Train, the superintendent and government quinologist of the Bengal cinchona plantations:

The year under review was remarkable for the rainfall, which is said to have been the heaviest on record since the plantations were started thirty-six years ago. It did considerable damage to the plantations, the loss being estimated at nearly 6,000. The continuous wet weather was unfavorable to the growth of cinchona, added to which the damage done by *helopeltes*, which usually causes no serious loss, was also considerable, especially to the younger *calisayas*. From the Mungpoo division 185,749 trees were removed, and from the Sittong division 10,111, while 223,981 young trees were planted out. The uprooted trees consisted of 112,800 *Calisaya ledgeriana*, 82,432 *hybrid*, and 628 *succirubra*. The area of the extensions for the year amounts to 160.78 acres, of which 159 acres have been devoted to 219,121 plants of *Calisaya ledgeriana*, and 1.78 acres to *hybrid*. The area planted exceeds by forty acres the space that in the last report it was hoped could be overtaken. A portion of the Dumsong Forest block has been converted into a cinchona reserve, and during the coming season an effort will be made to plant out 100 acres of it with *Calisaya ledgeriana*. The bulk of the bark harvested during the year was again taken from sickly or stunted trees, and amounted to 208,652 lbs., which was practically all obtained from quinine-yielding barks. It was, as usual, made over to the cinchona factory for manufacture into quinine and febrifuge. In addition to this quantity 153,739 lbs. of bark was purchased. The issues of quinine amounted to 123,616 ozs. and of cinchona febrifuge 2,756¾ lbs.—the small decrease in the output of both of these products from the output of the previous year being due to the diminished demand from government institutions.—Chem. and Drugg., Aug. 24, 1901, 358.

Cinchona—Micro-Chemical Study of the Living Plants.—A. Goris and M. N. Reimers have made some valuable micro-chemical studies of cinchona plants, the results of which are summarized as follows: The alkaloid occurs in all parenchymatose cells—in solution in the young leaves amorphous in the cells of the secondary bark. It is found mainly in the living cells, occasionally also in the walls of deadened cells, but is never found in the sieve tubes, nor in the immediately adjacent parts, and is therefore not found in the elements of the plant organism through which the albuminoids are distributed, but in those carrying the carbohydrates. As has been shown by Lotsy, the formation of the alkaloid occurs in the leaf, from which it is carried to the stem and root where it is deposited in an amorphous condition. This explains why cinchona bark collected from the lower portion of the stem contains more alkaloid than that from the upper portion, which simply serves as a passage-way for the alkaloid towards the root, where it accumulates. Strong light appears to retard the formation of alkaloid in the leaves, an observation which justifies the method practiced in Java to plant the trees in shady situations, in which they are protected from the direct rays of the sun. Trees bearing well-developed, dark green, healthy leaves contain more alkaloid than those

with yellowish leaves. The alkaloid occurs in the cells in all probability as kinate or cinchotannate. The lacticiferous vessels, lacunes, and oleo-resin cells are neither branched nor united; in their young state they are provided with partition walls, which are soon lost however. Their content is tannin like. The tannin of the tannin cells differs chemically from the tannin of the alkaloid cells.—Pharm. Ztg., Sept. 14, 1901, 737; from Bull. des Scienc. Pharm., III, No. 8, 824.

Cinchona—Criticism of Various Pharmacopœial Assay Processes and Improvements.—In a communication to the Belgian Academy of Medicine, Myttenaere criticises the methods of assay of cinchona preparations as given in the Dutch, British, Swiss, Austrian and Italian Pharmacopœias, then gives the details of the process which he considers most satisfactory. He takes 7 grams of the finely powdered bark, and shakes it for three hours with 140 Cc. of chloroform and 10 Cc. of ammonia solution. He then adds 3 grams of powdered gum tragacanth and 20 Cc. of water. The whole is shaken well and allowed to settle, 100 Cc. of the chloroformic solution is then filtered off. The solvent is evaporated, and the residue dried on a water-bath. It is then redissolved in a little chloroform and treated with 15 Cc. of decinormal hydrochloric acid. After due separation of the solvent the excess of acid is titrated with alkali, and the number of Cc. of the acid used, multiplied by 0.0309, represents the weight in grams of alkaloids in 5 grams of the bark. Corresponding methods are given for the determination of the alkaloids in galenical preparations of the bark.—Chem. & Drugg., June 14, 1902, 922; from Répertoire de Pharmacie, 1902, 218.

Cinchona—Improved Process of Assay.—Referring to some objectionable features in the method of assaying cinchona bark and its fluid extract recently prepared by him, H. M. Gordin now recommends the following modified form of that method which he considers to be free from any source of error:

Put 10 grams of the bark in very fine powder into a 300 Cc. bottle, pour in 200 Cc. of modified Prollius' fluid (Lyons' Manual) and shake continuously for four hours. Set aside until well settled and pour off 100 Cc. (=5 grams) into a distilling flask. Distil off the ethereal liquid, removing the last 2 or 3 Cc. by a current of air. Dissolve the residue in 10 Cc. of hot water containing 5 per cent. sulphuric acid, cool and filter into a separator, washing the flask and filter repeatedly with acidulated water.

For the fluid extract put 5 Cc. into the separator and proceed in both cases as follows: Pour into the separator 40 Cc. of a mixture of 3 parts of ether and 1 of chloroform, and add 10 or 15 Cc. of 10 per cent. potassium hydroxide and shake well. Set aside until the liquids separate, draw off the lower aqueous liquid into a second separator and shake it out twice more with the ether-chloroform mixture, using 30 Cc. each time. Filter the ether-chloroform liquid through a small plain double filter into a dis-

tilling flask, and distil to dryness, removing the last 2 or 3 Cc. by a current of air. Redissolve the residue in about 10 Cc. of hot 5 per cent. sulphuric acid, cool, filter into a separator, washing the flask and filter repeatedly with acidulated water, make strongly alkaline with 10 per cent. potassium hydroxide and shake the alkaloids out three times with chloroform, using 30 Cc. each time. Filter the chloroform solution through a small plain double filter into a tared flask and distil the chloroform off completely, removing the last 2 or 3 Cc. by a current of air. Dry the flask at 130° C. for two hours and weigh. The weight multiplied by 20 gives the percentage of total alkaloids.

Now redissolve the alkaloids by pouring into the flask about 5 Cc. or more of chloroform and warming gently, add 5 or 6 grams of clean coarse (No. 6) quartz and remove the chloroform completely by placing the flask in the water bath and twisting it continuously. The last traces of chloroform should be removed by a current of air. When the flask is cold, there should be no solid matter adhering to the flask. If this is the case, as happens with rich (over 10 per cent.) samples of bark, the alkaloids must again be dissolved in chloroform and a few grams more of quartz be added. After the complete removal of the chloroform as before, 10 Cc. of ether are poured into the flask and the latter shaken gently for half an hour in a horizontal plane; the ether is then filtered through a small filter into a light tared flask, the quartz and the filter are washed four times with ether, using 5 Cc. each time, the ether distilled off completely, removing the last 2 or 3 Cc. by a current of air, and the flask dried at 130° C. and weighed. The weight multiplied by 20 gives the percentage of ether-soluble alkaloids.—Drug. Cir., Sept., 1901, 184.

Cinchona Assay—Necessity of Care in Powdering the Bark.—J. B. Nagelvoort records some criticisms based on experiments made with a method of assaying cinchona bark recently proposed by B. A. Van Ketel in "De Indische Mercur" (July 2, 1901), which were undertaken at the request of the latter. Both Van Ketel's method and Mr. Nagelvoort's observations on it must be consulted in the original, as quoted below. An interesting observation, that applies equally to all methods of cinchona assay, however, is that made by Van Ketel with regard to the importance of securing a true representative sample of the bark, *e. g.*, that the whole of the sample must be reduced to a uniform fineness and not a part of it left unpowdered. He offers evidence that careless pulverization and sifting, whereby dust is lost, will yield higher results than the conditions actually are. Mr. Nagelvoort has had opportunity of confirming this observation on a sample of the same kind of bark as that used by Van Ketel, namely, *Cinchona succirubra*, var. *Ledgeriana* (root-bark). This contained a total of 7.67 per cent. alkaloid, which was distributed as follows in the different siftings:

First sifting, 5.86 per cent.; second, 6.94 per cent.; third, 7.43 per

cent.; fourth, 7.9 per cent.; fifth, 8.53 per cent.; sixth, 8.8 per cent.; and seventh sifting, 8.9 per cent.—the relative proportions of the different siftings not being given, however. With regard to Van Ketel's process, it may be mentioned that Mr. Nagelvoort's experience with it was not very encouraging.—*Amer. Journ. Pharm.*, Jan., 1902, 25-31.

Cinchona Bark—Estimation of Quinine in Total Alkaloids.—Frederick T. Gordon observes that while the assay process of the Pharmacopœia for estimating quinine in the total alkaloids from cinchona bark is well within the capabilities of the druggist and simpler than most assays, it has several drawbacks—from the use of so volatile a solvent that loss of quinine will be certain unless the greatest care is used, from evaporation or from failing to collect every drop or the depositing of the alkaloid on funnels and vessels used, and from its not taking into account the ether-soluble amorphous alkaloids in cinchona bark. A method that will not take up too much time and whose results will be accurate within reasonable limits would be an improvement on that of the U. S. P., and the author finds such a method in the following lines suggested by Dr. Casper, which is easy of application, accurate, and does not take up much actual time: Dissolve the total alkaloids from 10 Gm. bark by whatever method obtained, in a slight excess of dilute HCl, making the acid solution up to 10 Cc. in volume, add solution of sodium hydrate in excess, and shake up at once with 20 Cc. petroleum ether (gasoline or benzin). A 2-oz. bottle with a square neck will be found to be just the thing to use. Allow the petroleum ether to separate, pour off carefully into a clean 100 Cc. Erlenmayer flask, and repeat the washing of the alkaloidal solution with 10 Cc. portions of petroleum ether until a drop of the solvent evaporated on a crucible lid gives no reaction with Mayer's reagent, collecting the washings in the flask. Now set aside the petroleum ether solution of alkaloids over night in a cool place (60° Fahr.), for crystallization of the slightly soluble cinchonidine and quinidine, carefully pour off the solution from these crystals, washing them with a few drops of petroleum ether, and evaporate in a tared beaker to dryness. Dry at 100° C. to constant weight and weigh, weight will equal quinine in 10 Gm. of bark.

To check this result, dissolve the quinine residue in excess of N/25 HCl, (20 Cc.) with the aid of a little alcohol if necessary, titrate back with N/25 alkali, using haematoxylin as indicator, normal salts of quinine acting neutral to the indicator. Multiply the number of Cc. of N/25 acid neutralized by the alkaloid by 0.0129, 1 Cc. of N/25 acid being equal to 12.9 Mg. of quinine.—*Proc. Pa. Pharm. Assoc.*, 1901, 132-134.

Ipecac—Percentage of Alkaloid in Commercial Sorts.—Cæsar & Loretz (*Geschaefits-Bericht*, 1901) report the results of assay of 42 lots of ipecac, representing a total of 5,400 kilos of the Rio and Carthagena varieties. *Rio-ipecac*, assayed by Keller's method and titrated, showed from 2.396 to 3.150 per cent., and when assayed by the Pharm. Germ. method, 2.494

and 3.150 per cent. of total alkaloid. *Carthagenaipecac* showed by the Keller method a total alkaloidal content of from 2.434 to 3.301 per cent., and when assayed by the Pharm. Germ. method, 1.677 to 3.253 per cent.—Pharm. Rev., Nov., 1901, 514.

Ipecacuanha—Relative Value of the Carthagenaipecac and Rio Drug.—Several interesting papers dealing with the relative alkaloidal and medicinal value of Rio and Carthagenaipecac are published in the Ber. d. D. Pharm. Ges. (1902, No. 2). Körner has determined the alkaloids in the two varieties, with the following average results:

	Rio.	Carthagenaipecac.
Emetine	1 per cent.	1 per cent.
Cephaeline	0.5 per cent.	1 per cent.
Psychotrine	0.1 per cent.	0.2 per cent.

The experiments of Kobert and Lewin have shown indubiously, not alone that pure emetine hydrochloride is a weaker emetic than pure cephaeline hydrochloride, but also that the extract of the Rio drug is less active as an emetic than that of the Carthagenaipecac drug, which is the richer in cephaeline. This observation leads P. Siedler to advocate the re-introduction of Carthagenaipecac into medicinal use, and in this view he is supported by Kobert, while Burse suggests that the return to favor of the Carthagenaipecac drug, and its eventual admission into the Germ. Pharm., depends upon whether it is regarded more desirable to employ the drug on account of its emetic properties, or on account of its utility as an expectorant, the Rio drug being probably the superior of the two for the latter purpose.—Pharm. Ztg., Mar. 12, 1902, 199.

Carthagenaipecac—Percentage of Alkaloid and Moisture.—Robert C. Purcell and W. R. Graham have determined the moisture and alkaloid in nineteen parcels of Carthagenaipecac. The lowest percentage of alkaloid in the air-dry drug was 1.92 per cent., the highest 2.36 per cent., while the average showed 2.14 per cent. The amount of moisture in the air-dry drug varied between 5.30 per cent. and 7.30 per cent.—average 6.03 per cent.—Proc. Pa. Pharm. Assoc., 1901, 193.

Coffee Blossoms—Constituents.—According to investigations the flowers of the coffee plant, which when dry have a yellowish-brown color, spicy odor and bitter taste contain about 1 per cent. of caffeine and probably also cafeeo-tannic acid. The presence of phytosterin and of a reducing sugar were also qualitatively determined.—Pharm. Ztg., May 10, 1902, 365; from Ztschr. f. öffentl. Chem., 1902, No. 8.

Roasted Coffee—Characters of the Empyreumatic Oil.—Erdman has subjected the volatile oil, which passes over into the distillate under distillation with steam, to comprehensive investigation. From 150 Kgm. of roasted and ground Santos coffee he obtained by distillation with steam under a pressure, shaking out of the distillate with ether, and evaporation

of the ether, 83.5 Gm. (= 0.0557) of a brown volatile oil, having the sp. gr. 1.0844, and the aroma of coffee, and containing nitrogen. The greater part of this oil passed over between 150° and 190° C. when distilled under ordinary pressure, forming a light colored oil; at a higher temperature evidence of decomposition was observed. The residue formed a thick brown syrup. Both the rectified oil and the crude oil had a strong acid reaction, the acidity being due to valerianic acid, which is present to the amount of 38.9 to 42 per cent., and which is readily removed by shaking the oil with sodium carbonate solution. The acid-free oil on fractionation yielded furfuric alcohol, and about 50 per cent. of a higher boiling fraction which had the odor of coffee in an intensified degree. With the intensity of odor, the nitrogen content of the fractions also increases, from which the author infers that the odorous body is a nitrogenous substance, and not a phenol as assumed by Bernheimer. The presence of phenols has, however, also been determined in certain fractions examined.—Pharm. Ztg., June 11, 1902, 459; from Ber. d. D. Chem. Ges., 1902, 1846.

Coffee—Roasting by Electricity.—J. Boes has examined coffee, roasted by electricity, and finds that the caffeine contained in it has undergone no chemical change, nor its percentage reduced from that present in the normal coffee. It is noteworthy that coffee roasted by electricity possesses a more agreeable aroma than that roasted in the ordinary way.—Pharm. Ztg., Mar. 15, 1902, 210.

Coffee—Cane Sugar the Only Saccharine Constituent.—L. Graf, in view of the contradictory statements concerning the presence of sugar in coffee seeds, has made a series of comprehensive investigations which prove conclusively: 1. that coffee seeds do contain sugar; 2. that this sugar is cane sugar; 3. that they contain no other sugar whatever; 4. that caffeeo-tannin, which is universally regarded to be a glucoside composed of caffeeic acid and glucose, contains or yields no glucose whatever, and is therefore not a glucoside. The author's experiments were made with perfectly fresh seeds, which he removed personally from fruits received from the Island of Réunion. The amount of cane-sugar was found to be 0.5 per cent., calculated for the fresh seeds.—Pharm. Centralh., Nov. 28, 1901, 755; from Ztschr. f. angew. Chem., 1901, 1077.

Yohimbi Bark—Botanical Source and Description.—Dr. K. Schumann has identified yohimbi bark, the botanical source of which has hitherto been in doubt, to be derived from a new species of *coryanthe*, which is now described under the name of

Coryanthe yohimbi, Schum. in the "Notizblatt der Bot. Gärt. im Museum zu Berlin (Vol. 3, No. 25, 93-94). It is a large tree growing near Kribi, in the southern district of the Cameroons, and is distinguished from the few other species of the genus by the long tails to the corolla-lobes.

The bark is stated to be 3 to 10 mm. thick with an external corky layer of a grey-brown color covered with isolated lichens. It shows numerous longitudinal and transverse fissures like some old specimens of cinchona bark. The transverse fracture is of a uniform yellowish-brown color, and presents a short, soft, fibrous fracture like rough velvet. Under the microscope the structure much resembles that of cinchona, but differs in the arrangement of the bark-fibers of the secondary bark, which is in definite long, radial series.—Pharm. Journ., Feb. 22, 1902, 141.

CAPRIFOLIACEÆ.

Sambucus Niger—*Isolation of a New Alkaloid from the Bark*.—F. Malméjac has isolated a new alkaloid from elder bark, together with a tannin, a purgative resin, and a yellowish-red oil. The alkaloid, which the author has named

Sambucine, was obtained as follows: The bark was extracted with alcohol acidified with tartaric acid; the acid residue, after evaporating the solvent, was first extracted with ether, then made alkaline with sodium bicarbonate, and again extracted with the same solvent. On the spontaneous evaporation of the second ethereal extract, small, extremely hygroscopic crystals were formed, which rapidly disappeared on exposure, melting to a colorless oily liquid, which, however, recrystallized in a desiccator over H_2SO_4 . The taste was bitter, and produced tingling on the tongue. The aqueous solution of the body gave marked precipitates with all alkaloidal reagents.—Pharm. Journ., July 27, 1901, 89; from Journ. de Pharm. Chim.

Viburnum Ellipticum, Hook.—*Structure of the Bark, &c.*—R. H. Denniston having recently secured the bark of *Viburnum ellipticum*, a species of *Viburnum* peculiar to Washington, Oregon, California, and thence to British Columbia, has made a study of its structure with the object mainly of supplementing his studies of a number of American *Viburnums* made by him in 1898. *Viburnum ellipticum* is related to *V. pubescens* and *V. dentatum* of the eastern states. It is a shrub growing from two to five feet high, with scaly buds; leaves broadly oval or elliptical, rounded or obtuse at both ends, coarsely dentate above middle; young shoots hairy; cyme dense, peduncle; flowers perfect; fruits oval, bluish, $\frac{1}{2}$ inch long; stone grooved. The one year old stems are covered with a reddish smooth bark, dotted over with numerous, rounded lenticels. As the bark becomes older, the outer corky cells peel away from the stem, giving it a roughened appearance. The author gives a comprehensive description of the microscopic elements of the bark, which are shown in a plate exhibiting the stem-bark in transverse, tangential and longitudinal sections, together with the end of one of the characteristic sieve tubes very much magnified. The shrub, which has about the same form and height as

V. acerifolium, is also shown in a full plate engraving, as also are the characteristic broadly oval leaves, which distinguish it from this species, in another, showing also the flowers and fruits.—Pharm. Archives, April, 1902, 61–65.

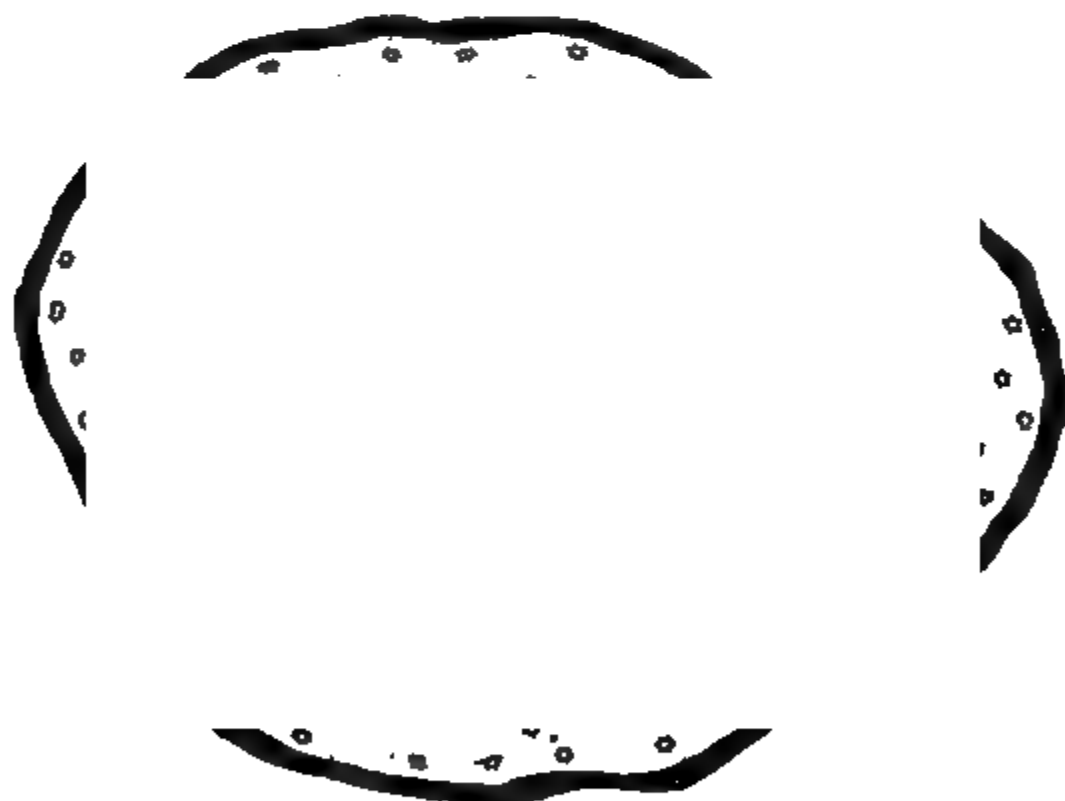
LORANTHACEÆ.

Mistletoe—Toxic Constituent.—The seedling plants of the mistletoe contain, according to the investigation of M. Lament, a substance which is toxic to the pear tree. This substance occurs also in the pulp of the mistletoe berry, and is no doubt secreted in the embryo.—Pharm. Journ., Jan. 18, 1902, 41; from Compt. rend., 133, 959.

UMBELLIFERÆ.

Ferula Asafetida, L.—Anatomical Structure of the Root.—Inasmuch as it is the root of *Ferula asafetida*, L., that preponderatingly yields asafetida, it is remarkable that a study of its anatomical structure has hitherto been only very superficial; the recent studies of the subject by A. Goris are therefore a welcome addition to the history of the plant and drug, his paper being accompanied by the illustrations shown by Figs. 47 and 48, in which the characteristic structural features of their valuable roots are clearly delineated. A transverse section of the root, but below the ventricose thickening of the same (Fig. 47), exhibits the perfectly characteristically

FIG. 47.

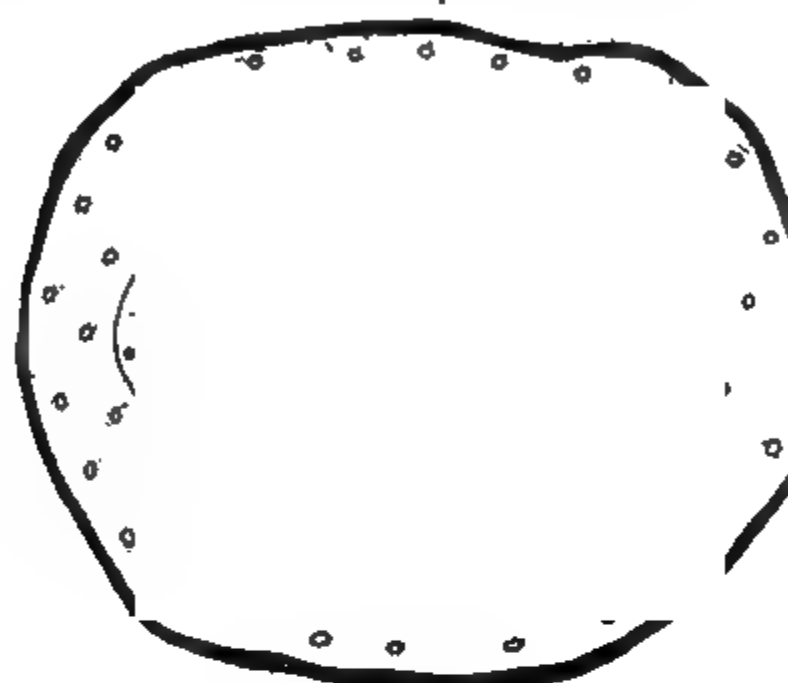


Transverse Section of Root.

twisted cambium ring, which in the upper portions of the root unlaces itself more and more in tolerably regular intervals, thus resulting in the appearance of numerous vascular bundle complexes scattered throughout

the parenchyme. By Fig. 48 this structure is shown as it topmost part of the root. Near to the thickest part of the from 20 to 30 such isolated vessels. Under a lens of 1 strongly developed cork-layer, superimposing a cortical pa posed of roundish cells, may be recognized. Imbedded rows of secretory canals, which are plainly visible in Fig

FIG. 48.



Topmost Part of Root.

parenchymatous tissues surround in the same way each of the mentioned isolated vascular bundles, between which large cells are exhibited.—Pharm. Ztg., July 13, 1901, 562; from Journ. Chim., 1901, No. 12.

Asafetida—*Unsatisfactory Quality*.—Caesar & Loret. Bericht" for 1901) report that the quality of asafetida is from year to year, and that last year's supply of the drug was 50 to 80 per cent. of ash. Only very small quantities of "tears" could be obtained which came within the 10 per cent. of the Pharm. Germ. If from such lots clear large tears were obtained, the drug yielding only 3 per cent. of ash could be obtained. Nov., 1901, 514.

Ammoniac—*Pharmacopæial Quality*.—Lyman F. Kebler reports that ammoniac is frequently contaminated with other gum matter, fragments of wood and other substances insoluble in water. A good article should not yield more than 10 per cent. of residue left after treating powdered ammoniac with strong alcohol and drying at 100° C. should not be more than 50 per cent.—March 24, 1902, 161.

Coriander—*Anatomy of the Fruit in Various Stages of*

E. Perot has obtained very interesting and important results from an examination of coriander fruit in various stages of development. It is well known that ripe coriander fruit, such as is met with in commerce, contains only two vittæ in each mericarp, both being situated on the commissural surface. Perot shows that the young fruit contains in addition a number of vittæ on the dorsal surface of each mericarp as well as five secreting ducts that accompany as many fibrovascular bundles from the stem and are continuous with corresponding ducts in the stem. The vittæ, on the other hand, are restricted to the fruit and have no connection with any secreting tissue of the stem. As the fruit develops, both the vittæ and ducts on the dorsal surface become compressed and finally break down into tangentially elongated cavities. The thin band of tissue external to these subsequently ruptures and in part perishes, so that the ripe fruit exhibits only here and there fragments of epidermis adhering to the pericarp. The author thinks that the disagreeable odor that characterizes the young fruit may be due to the oil secreted in the dorsal ducts and cavities; as the fruit ripens this secretion is lost, the odor becomes agreeable and aromatic, and is then to be ascribed solely to the oil contained in the commissural vittæ.—Pharm. Journ., Feb. 1, 1902, 81; from Bull. des Sc. Pharmacol., 3, 385.

Ænanthe Crocata—*A Dangerous English Weed*.—E. M. Holmes, having identified two specimens of root, the one supposed to be celery, growing wild, the other the root of *Solanum nigrum*, to be the roots of *Ænanthe crocata*, he calls attention to the highly poisonous character of this plant, which is probably the most dangerous and virulent of all native English poison plants. Dangerous (1st) because it is a common plant in ditches inland, and by the side of streams, especially near the sea; (2d) because in its early stages of growth the leaves bear a strong resemblance to celery; and (3rd) because the roots have often been mistaken for parsnips, are somewhat tempting in appearance, are not unpleasant to the taste, and have not any deterrent bitterness or acidity to act as a warning. It may be said to be the most poisonous, since even aconite does not cause death more quickly, and yew is only fatal under certain conditions, whereas *Ænanthe crocata* is known to have produced death in less than an hour, and there is no known antidote to the poison. As the illustrations of this plant, even in some of the best works on British botany, are not so full as they might be, Mr. Holmes gives a careful and minute description of the plant and its various parts, with excellent illustrations, by which the plant may be easily recognized even by those who do not take a special interest in botany, which cannot be profitably condensed and must therefore be consulted in the original, in Pharm. Journ., May 24, 1902, 431-432.

Phellandrum Aquaticum—*Therapeutic Value of the Fruits*.—Hegewald calls attention to efficiency of phellandrum fruits in the treatment of affections of the respiratory organs. Given in form of infusion it alleviates

cough, prevents the development of tubercles, and production of tubercular cavities in the lungs. These salutary uses of the water-fennel seeds (= fruits) as teas in domestic practice.—Pharm. Ztg., Oct. 9, 1901. f. Homeop., 1901, No. 72.

RANUNCULACEÆ.

Aconite—*Structural Distinction of the Roots of Aconite*.—Goris contributes an important paper in which he describes the structural texture of the roots of the five species of *Aconite*, summarized in the following :

(1) *A. napellus*.—The root has a normal structure. The mature root is characterized by a stellate cambium with projecting angles.

(2) *A. lycoctonum*.—This species possesses a rhizome which is not a solid body, but consists in great part at least of anastomosing strands, which are united into a solid body as well as near the lower extremity of the rhizome. The structure of the young rhizome is normal ; but, as it increases in size, groups of vessels become separated from one another, forming a ring. A circle of cells within this ring suberizes as well as the pericycle, the tissue in the centre and at the periphery perishing in consequence. The hollow ring thus formed divides into segments, the two circles of cork cells approaching one another and unite and so split the ring up into as many distinct strands.

(3) *A. anthora*.—In this the circle of vascular bundles is divided into strands, but each strand is surrounded by a ring of cork cells which remains embedded in parenchymatous tissue which, though it contains starch and collapses, never perishes so as to allow of the formation of distinct strands.

(4) *A. uncinatum*.—The mature root presents a stellate structure beyond which is a circle of isolated bundles. These angles of the cambium becoming strongly marked, and the bundles themselves becoming separated and pushed towards the periphery.

(5) *A. ferox* var. *atrox*.—This root also possesses a normal structure when young, but as it increases in size groups of vessels become separated and within them a cambium. These two circles of vessels approach at two or more points, and finally result in the formation of a number of distinct strands. The result is the same as in *anthora*, but the means by which it is arrived at are quite different.

Mr. Goris has also carefully examined the structure of Indian aconite roots, much valuable material for which was furnished by Dr. Watt and Dr. Prain, of Calcutta. He finds that *A. ferox* var. *laciniatum*, P. Br., and var. *spicatum*, P. Br., have a normal structure.

sembling that of *A. napellus*; but that the vars. *atrox*, P. Br., and *polyschisa*, P. Br., have the structure described under (5). Commercial "bish" appears to always possess the structure of *A. napellus*, and probably consists of a mixture of the two first-named varieties. The paper of Mr. Goris is fully illustrated with drawings of the roots of all the species and varieties described, as well as with sketches of their structure; it should be consulted by those who desire further and more detailed information on this interesting and important subject.—Pharm. Journ., Nov. 23, 1901, 576; from Bull. de Scienc. Pharmacol., iii, 103.

Aconite Root—Commercial Quality.—Frederick T. Gordon, through the courtesy of several large manufacturing houses, has ascertained that the roots of *Aconitum ferox* have recently been offered on the American market in several instances. It was also reported to him that aconite has been met with that contained considerable of the roots of other species of *Aconitum*, and one lot is mentioned as containing horse-radish. Others were evidently collected out of season, as evidenced by their slight acidity. Japanese aconite, also, has been offered by itself as true aconite or in admixture with it.—Proc. Pa. Pharm. Assoc., 1901, 121.

Hydrastis Canadensis—Percentage of Hydrastine.—Five lots of golden seal analyzed by Robert C. Purcell and W. R. Graham yielded the following percentages of hydrastine by weight: 2.76, 3.10, 3.70, 3.62 and 4.16 per cent. Ether was employed in each case to dissolve the hydrastine.—Proc. Pa. Pharm. Assoc., 1901, 193.

Hydrastis—Method of Assay and Commercial Quality.—O. Schreiber has subjected ten samples of hydrastis root, as found in the European markets, to alkaloidal assay by the following method: The amount of moisture having been determined in 10 Gm. of the powdered sample by drying to constant weight, the dried powder was moistened with a mixture of ammonia, 5 Cc., alcohol, 5 Cc., and ether, 30 Cc., and dried. It was then extracted in a Soxhlet with ether; the ether extract shaken out with 15 Gm. of 5 per cent. hydrochloric acid in a graduated cylinder. The ethereal layer was decanted, the acid extract washed with more ether to remove resinous matter, and the ether decanted. The volume of ether over the acid liquor was then adjusted to exactly 50 Cc., ten Cc. of ammonia added and the whole well shaken until the whole of the precipitated alkaloid was dissolved in the ethereal layer. After separation, 40 Cc. of this was decanted ($= \frac{4}{5}$ of the whole), into a tared capsule, about half the ether evaporated off with a gentle heat, the rest allowed to evaporate spontaneously. In this manner almost colorless crystals of hydrastine were obtained which were finally dried to constant weight on the water-bath. The poorest sample examined was thus shown to contain 2.85 per cent., and the best 4.16 per cent. of alkaloid.—Pharm. Post., 1901, 36, 321.

Illicium Floridanum—*Structure and Development*
 Schlotterbeck and C. R. Eckler have made a study of the development of the fruit of *Illicium floridanum*, a species restricted to the southern states of North America, swamps of Florida, Alabama and Mississippi. Both other American species, *Illicium parviflorum*, have been studied by botanists as well as chemists, while the Asiatic species, *religiosum* have been subjected to extended botanical consideration. The leaves of *I. floridanum* are four to five half inches wide, oblong lanceolate, entire, smooth, and contain much mucilage. When dry, they are very fragile and crushed. The flowers are about an inch wide, have dark purple linear petals in whorls. Sepals six, free, of the same color. Stamens thirty or more, and very short. There are generally thirteen, are erect in the flower, but after they have been effected they begin to spread out until they assume the position seen in the ordinary star anise. The ovary consists of from twelve to fifteen carpels, and occasionally more, arranged, but the usual number is thirteen. The capsule is covered with a curved beak, rather woody and wrinkled, of a dark color at the upper suture, though in many cases the seeds are attached to the solid tissue of the carpel at the under side. The seeds are many seeded, and have a fragrant odor and a sweetish taste. The seeds are odorless and taste oily. The fruit stalk is short, length, generally curved, enlarged and wrinkled at the base, and to the fruit. The remaining portion of the paper contains microscopic characters of the fruit, illustrated by plates of the fruit elements in different stages of development.—Pharm. Rev., 1901, 201-205.

Xylopiæ æthiopica—*Constituents and Uses of the Fruits*
 De Rochebrune, the fruits of *Xylopiæ æthiopica*, the black pepper, contain an alkaloid, which he has named

Anonaceine, crystallizing in long, fine prisms, a very soluble solid. The volatile oil has a pleasant, aromatic, cinnamon-like odor, and pervades the entire tree, being contained also in the bark and bast of the trunk. The fruits are employed as a spice and condiment, and also have a reputation for being used for making an embrocation, and, in form of decoction, for the treatment of colic, as vermifuge, and as aphrodisiac. Aug. 51, 1901, 693; from Pharm. Rdsch., 1901, No. 10.

MENISPERMACEÆ.

Calumba Root—Falsification.—F. H. Alcock in the course of some examinations of calumba root with the object of making comparative ash-determinations of the whole root and the powder, noticed along with the genuine root some pieces that on close inspection were found to differ from the genuine. The slices were markedly yellow, had a hard woody center, were very porous, and lacked the ring exhibited by genuine slices. It composed about 25 per cent. of the parcel examined. One piece yielded 16.6 per cent. of ash, another 11.9 per cent., while the amount of ash from a genuine piece was only 7.0 per cent. This leads the author to presume that the difference in the percentage of ash recently found in powdered and whole calumba by Messrs. Moore and Priest, 10.3 to 11.3 from the powder, 5.1 to 7.4 from the whole root, may be due to the falsification of the drug by the root observed by him.—Pharm. Journ., Nov. 2, 1901, 502.

OCHNACEÆ.

Ochna Albo-Serrata—A New East-African Dye Stuff.—Dr. M. Greschhoff has made a chemical investigation of the bark of *Ochna albo-serrata*, a tree native to German East Africa. The bark is yellow, and has an astringent, somewhat acid, but not bitter taste. The presence of berberine was suspected, but it was found to contain no alkaloid. The yellow coloring matter, obtained by exhausting the bark with an alkaline solution, and precipitation with hydrochloric acid, or by exhausting the bark with alcohol after removing all matter soluble in water, is an orange yellow amorphous resin, easily soluble in alcohol, amyl alcohol, ether or glacial acetic acid and alkaline solutions, but only slightly in boiling water. It appears to belong to the class of phlobaphen dye-stuffs formed by oxidation of tannin present in the bark. Its formula, so far as could be ascertained from several experiments, is $C_{14}H_{11}O_4$ or $C_{14}H_{13}O_5$. In a similar yellow bark from the same district supposed to be derived from a species of *Xanthoxylon*, but differing in having the coloring matter layers in the cortical parenchyma alternating with uncolored layers, whereas in the ochna bark it forms a thick outer crust, the color was also found to be due to a phlobaphen or oxidized tannin, having apparently the composition $C_{20}H_{20}O_9$.—Pharm. Journ., April 5, 1902, 274; from Notizbl. Bot. Gart., Berlin, No. 22, p. 41-43.

RUTACEÆ.

Brucea Sumatrana, Roxb.—Chemistry and Physiological Action of the Seeds.—The seeds known in Chinese medical practice by the name of

Ko-Sam, which have long enjoyed a reputation among native practitioners as a remedy in dysentery, have been identified by E. Heckel and Fr. Schlagdenhauffen to be the seeds of *Brucea Sumatrana*, Roxb., and

were subjected by them to chemical examination. They contains a considerable percentage of fixed oil, the presence of saponin, and a second bitter principle, distinct from quassindrin and Phisalia attribute the medicinal virtues of the seeds to a glucoside,

Kosamin, which is soluble both in water and in dilute alcohol. —Pharm. Ztg., Mar. 1, 1902, 170.

Casimiroa Edulis—*Constituents and Medicinal Uses of Casimiroa Edulis*.—Francisco Hernandez has determined the following constituents of the seeds of *Casimiroa Edulis*, a Mexican plant known by the name of *Labote Sonifera* and *Labote Blanco* :

Resin, soluble in ether ; volatile oil ; fat ; gum ; starch ; mineral matter ; an alkaloid to which he attributes the physiological activity of the seeds. It appears to be chiefly that of a powerful antiseptic, the roasted seeds being extremely effective in cleaning putrid ulcers, promoting healthy granulation and rapid healing.—Pharm. Ztg., Mar. 1, 1902, 170.

Clausena Anisata—*An East African Fever Remedy*.—According to Engler the leaves of *Clausena anisata*, var. *mollis*, are used in Usambara as a remedy for fever. It is used by boiling the leaves in water and inhaling the steam.—Pharm. Journ., May 17, 1902, Notizbl. Bot. Gart. Berl., 23, 64.

Guaiacum Officinale, L.—*Volatile Oil and Other Constituents of Guaiacum Bark and Wood*.—In a recently published thesis on *Guaiacum Officinale*, L. (Strassburg, 1901), E. Paetzold mentions that the bark yields about one per cent. of an essential oil. From the wood an oil could also be isolated, but this is not considered to be a constituent of the resin, its presence being explained by contamination of the resin with pieces of bark. Furthermore, the sticky guttae of the resin, when drawn into long threads, which exists along with the resin in genuine Guaiacum wood, yields a dipentene when submitted to dry distillation, which is identified by the formation of its tetrabromide melting at 122° C.—Mel's Rep., April, 1902, 43.

Jaborandi Leaves—*Percentage of Alkaloid*.—Robert C. W. R. Graham have found the majority of the lots of jaborandi leaves assayed by them during the year to come up to the standard set by the manufacturers, viz., 0.35 per cent. by titration. Six lots, however, did not reach that standard. They contained 0.17, 0.23, 0.24, 0.25, 0.27, and 0.28 per cent., and contained many stems, one sample as many as 2 per cent. —Proc. Pa. Pharm. Assoc., 1901, 192.

Jaborandi Leaves—*Method of Assay*.—G. Fromme recommends the following method for the assay of jaborandi leaves : 15 Gm. of leaves, in moderately fine powder, are macerated in 150 Gm. of chloroform.

15 Gm. of ammonia water for half an hour, under frequent agitation; the whole is then transferred to a plain filter and covered with a glass plate, the filtration towards the end being hastened by pouring a little water on the dregs. When a little more than 100 Gm. of filtrate has been obtained, this is shaken with 1 Cc. of water and set aside until any fine powder which may have passed through the filter has been taken up by the water and the chloroformic solution is perfectly clear. Then 100 Gm. of this solution, representing 10 Gm. of the drug, are extracted successively with 30, 20 and 10 Cc. of 1 per cent. hydrochloric acid; the united acid extraction is shaken with 20 Cc. of ether to remove chlorophyll, fat and resin, and, the acid layer being drawn off, it is rendered alkaline by ammonia and shaken out successively with 30, 20 and 10 Cc. of chloroform. The chloroform is evaporated and the residue weighed or titrated as may be most expedient—1 Cc. of $\frac{N}{1000}$ hydrochloric acid being equal to 0.00208 Gm. of pilocarpine.—Pharm. Rev., Nov., 1901, 514; from Caesar & Loretz, *Geschaefts-Bericht* for 1901.

Prickly Ash Bark—Superiority of the Southern over the Northern Variety.—W. L. Cliffe calls attention to the superior pharmacological value of the southern variety of prickly ash bark, from *Xanthoxylum Clava-Herculis*, and expresses the belief that the use of the northern variety, from *X. Americanum*, is not so much due to choice, as to the fact that this variety is generally supplied by jobbers upon orders for “prickly ash bark.” The bark of *X. Clava-Herculis* is far richer in the extractives that give the bark its medicinal value. He has prepared 50 per cent. wines from each kind of bark, and has demonstrated that the product from the southern bark excels in color, pungency and bitterness. Moreover, the bark in the case of the northern variety appeared to be fairly well exhausted, while the wine obtained from the southern bark appeared to be simply a saturation, the marc being incompletely exhausted and retaining distinct identity.—Amer. Journ. Pharm., Nov., 1901, 562.

Peganum Harmala—Colored Alkaloids in the Seeds.—In 1837 Goebel studied the constituents of the seeds of *Peganum harmala*, and described two alkaloids, *harmine* and *harmaline*, together with a red coloring matter, supposed by him to be formed by the action of alcohol and atmospheric air upon these alkaloids. O. Fischer has now subjected the seeds of this plant to chemical investigation and describes the following constituents: *Harmine*, a monacid base, having the composition $C_{13}H_{12}N_2O$, occurring in silky, glistening, colorless, rhombic prisms or needles, and melting at 257° – 259° ; *Harmol*, $C_{12}H_{10}N_2O$, *Harmane*, $C_{12}H_{10}N$, *Harmaline*, $C_{13}H_{14}N_2O$, and *Harmalol*, $C_{12}H_{12}N_2O$. A number of derivatives of these are also described. The author finds that

Harmaline and *Harmol* are basic coloring matters, an observation that is particularly interesting because heretofore berberine has been consid-

ered the only naturally existing alkaloidal coloring body.—Pharm Ztg., Dec. 4, 1901, 965.

GERANIACEÆ.

Flaxseed—Adulteration of the Meal with Mineral Oil.—His attention having been called to the appearance on the American market of flaxseed meal adulterated with mineral oil, Lyman F. Kebler secured a sample and on examination found the report well founded. It yielded 35.5 per cent. of fixed oil to bisulphide of carbon, an amount such as a high grade ground flaxseed might contain; but the meal appeared physically abnormal, and possessed a foreign odor and taste. A nearer examination of the oil obtained by extraction, and another obtained by expression from the same suspected meal, showed that the latter contained a considerable proportion of mineral oil amounting to about 40 per cent. of the total oil content. The author notes another adulteration with a fluorescent oil, similar to the mineral oil of the preceding sample, but showing an abnormally high acid number, and a saponification number of about 155. The exact nature of this he is unable to determine.—Amer. Journ. Pharm., Jan., 1902, 39-41.

STERCULIACEÆ.

Cacao—Determination of Fat.—v. Ledden-Hulsebosch finds it advantageous to subject cacao powder to the following preliminary treatment before finally extracting it in the usual manner in the Soxhlet apparatus: 2 Gm. of the cacao powder are boiled for 15 minutes in a beaker with 200 Cc. of water and 5 Cc. of hydrochloric acid, the hot mixture is transferred to a wet filter, and carefully washed with water. The filter and contents are dried at 100°, triturated with sand, and extracted in the well known manner with ether.—Pharm. Ztg., April 9, 1902, 277; from Pharm. Weekbl., 1902, No. 9.

Oleum Theobroma—Cause of Variation of Specific Gravity of Indentical Samples.—K. Dieterich has observed that a sample of cacao fat, having the sp. gr. 0.979 at 15° C. immediately after molding, had the sp. gr. 0.964 after the lapse of six days, and that this was further reduced to 0.961 after four days more. The observation is important since it points out the influence of time as a factor in determining the specific gravity of this fat.—Pharm. Centralh., Aug. 1, 1902, 465; from Helf. Annal., 1901.

TERNSTROMIACEÆ.

Tea—Localization of Theine.—U. Suzuki's studies lead him to conclude that the seeds of the tea plant do not originally contain any theine; also that the proteids of the seeds do not yield theine by reaction with hydrochloric acid, and that therefore the formation of theine during the germination of the seeds cannot be ascribed to a simple splitting off from the proteids, but in connection with a far-reaching transformation of the pro-

ducts of a metabolism. Light also exerts no direct influence upon the formation of theine, since etiolated sprouts contain nearly the same quantities of theine as do the sprouts developed in daylight. The cotyledons of the germinating seeds, as well as the stems and roots of the plant, contain but little theine, the leaves containing the largest quantity and this in nearly the proportion of their development. Furthermore, the author does not regard theine to be, like asparagin, a synthetic product, but a catabolytic one, since under the influence of ammonium nitrate no increase in the quantity of theine could be observed. While the stem bark contains only traces of theine, the buds contained it in moderate quantities. Concerning the localization of theine in the leaves, the author's experiments show that this base is stored in the epidermis. A section of the leaf when macerated for two days in a 3.4 per cent. solution of tannin, exhibited a voluminous precipitate in the epidermal cells, composed of minute globules which were proven to be theine tannate. In the remaining tissues of leaves only faint turbidity manifested itself.—Pharm. Ztg., Oct. 23, 1901, 849; from Bull. Coll. Agric. Tokyo Imp. Univ., 1901, 4, 289-297.

Tea—Micro-Chemical Determination of Exhausted Leaves.—Kleg proposes a micro-chemical test for the recognition of exhausted tea leaves as follows: A fragment of a tea leaf is triturated finely with water and calcium hydrate, dried, extracted with alcohol, and the alcoholic solution evaporated on a sheet of mica, from which the residue is sublimed upon a cover glass. On moistening this by breathing on it, it exhibits on the edges of the sublimate characteristic stellate groups of fine hydrous needles of caffeine, which extinguish polarized light at 31° , if the tea leaf has not been exhausted.—Pharm. Centralh., July 4, 1901, 422; from Chem. Ztg., 1901, 351.

AURANTIACEÆ.

Lemons—Development of Acidity.—E. Leuschner states that the formation of the acid in lemons is in part dependent on the nature of the fertilization, but to a greater extent to the treatment of the fruits after they are gathered, and the period of harvesting. It is important that they shall have attained a certain stage of maturity, and that they be not completely excluded from air during export. Experience in lemon-growing localities has shown that the fruits must be removed from the tree while still perfectly green, without a trace of yellow. In this condition they are stored in the fermenting house, where they are kept at a constant temperature during 2 to 3 weeks regulated to 50° . This process insures the "sweating out" of the sugar, as it is technically called. The fruit is then exposed to a lower temperature for a period which, according to circumstances, may be for several months, during which they attain the required acidity. The fermentation process to which the fruit is subjected by this treatment also has the purpose and result of rendering the peel thinner, for, when

first gathered, this is thick, spongy, and tough. With the disappearance of the sugar, and the preponderance of acidity, the peel becomes thin; whereas, if the fruit is gathered over-ripe, or merely ripe, the peel is thick, and the acidity deficient.—Pharm. Ztg., Mar. 12, 1902, 200; from Ztschr. f. öff. Chem., 1902, No. 2.

VITACEÆ.

Wines—A New Indicator for Use in Determining Acidity.—E. G. Runyon calls attention to the superiority of a mixture of corallin and malachite green over phenolphthalein and litmus, usually employed as indicators in determining the total acidity of wines. The reagent, as originally recommended by L. Lachaux, is prepared as follows: Three and one-tenth grams of corallin or commercial rosolic acid are dissolved in 150 Cc. of 90 per cent. alcohol, neutralized and mixed with 0.5 gram malachite green dissolved in 50 Cc. of alcohol. With this mixture alkalies give a purple color, which is changed to a green by acids. To test this coralline-malachite indicator in comparison with phenolphthalein and litmus, three samples of wine, claret (red), Rhine wine (white), and sherry (of medium color) were employed, the method being as follows: Transfer 10 Cc. of the sample to a beaker, dilute with about 300 Cc. of boiling distilled water, heat the mixture to boiling for a moment to expel all carbon dioxide, cool to about 75°, add 10 drops of the corallin-malachite solution, then add an excess of decinormal sodium hydroxide solution, indicated by a purple color, titrate the excess of alkali with decinormal acid solution, adding the acid solution slowly until the appearance of a distinct green color. The change in color is best observed by transmitted light. A trial showed that it was easier to detect the transition from the alkali to the acid side than the reverse. The results, as exhibited in the table appended to the text of the author's paper, although lower with the malachite indicator than with either of the others, are believed to be more correct, because the color reaction is more pronounced, and he feels justified in recommending it to the attention of chemists engaged in the analysis of wines, etc.—Chem. News, Aug. 9, 1901, 65; from Journ. Amer. Chem. Soc., 1901, No. 6.

Sweet Raisin Wines—Preparation and Composition.—Dr. Aug. Schneegans has examined some sweet raisin wines prepared directly from raisins, with the object of establishing constants for this class of wines. These wines are prepared by subjecting the raisins, previously comminuted and covered with water, to fermentation, without any foreign addition whatever, the amount of water being adjusted so as to produce a wine of the desired sweetness and strength. The wines are perfectly clear and of a light to dark-red color. Numbers I. and II. were prepared from various sorts of so-called "currants," which, being seedless and deprived of the combs, have a finer and less harsh taste than No. III., which was prepared from the so-called "Thyra-raisins," derived from Asia Minor, via Smyrna.

	I.	II.	III.
Specific gravity.....	1.0265	1.0249	1.0131
Alcohol, per cent. by weight.....	11.34	12.03	12.19
Alcohol, per cent. by volume	14.39	15.16	15.36
Extract.....	11.55	11.36	8.35
Sugar-free extract.....	4.15	4.13	6.03
Mineral constituents.....	0.298	0.299	0.584
Free acid.....	0.96	0.79	0.73
Volatile acid	0.18	0.13	0.11
Non-volatile acid	0.73	0.63	0.59
Total tartaric acid.....	0.17	0.16	0.10
Free tartaric acid	0.	0.	0.
Cream of tartar.....	0.11	0.15	0.13
Tartaric acid combined with alk. earth	0.08	0.04	0.
Glycerin.....	1.27	1.32	1.06
Invert sugar	7.40	7.23	2.32
Cane sugar	0.	0.	0.
Sulphuric acid.....	0.034	0.031	0.025
Phosphoric acid	0.055	0.054	0.092
Tannin and coloring matter	0.09	0.11	0.19
Nitrogen	0.027	0.026	0.05

—Arch. d. Pharm., 239, No. 8 (Oct. 30, 1901), 589–591.

Alsatian Wines—Low Percentage of Extraction.—Maurice Bernard calls attention to the low percentage of extraction observed by him in a number of Alsatian wines of undoubted source and purity. One sample examined by him yielded only 1.57 per cent., while another, after deducting the total acidity, would seem to contain as little as 0.934 per cent. of solids calculated as extractive. These wines therefore fail to come up to the present official minimum percentage of required extractive, which by the recent revision of the “wine ordinance” has been increased from 1.50 to 1.60 per cent. With regard to the relation of mineral constituents to extractive, the author observes that this is usually assumed to be in the proportion of 1:10. This, also, is not the case with wines grown on lime soil, such as is mostly found in Alsace, and such wines cannot therefore be condemned on the ground of high percentage of mineral constituents. In three different wines, yielding 1.892, 1.876 and 1.889 per cent. of extractive respectively he found, in the same order, 0.3126, 0.2630 and 0.2791 per cent. of mineral matter. These observations point out that implicit reliance can by no means be placed on the chemical analysis of wines, for it affords no guarantee of purity and source on the one hand, nor that the wine is not a purely natural product on the other.—Pharm. Ztg., Dec. 18, 1901, 1005.

Grecian Wine—Analysis.—J. Boes has analyzed a sample of Grecian wine, produced on the Island of Santorin by a missionary society, and of indisputably natural origin, with the following results: Alcohol, 11.12 per

OPIUM.

cent. ; extract, 14.07 per cent. ; dextrose, 11.0 per cent. ; cent. ; phosphoric acid, 0.064 per cent. ; total acidity, 0.6 had a good taste, resembling that of Tokay.—Pharm. Ztg., Feb. 15, 1902, 243.

Sicilian Wines—Average Composition.—Dr. J. Boes has been endeavoring to determine the chemical composition of a number of samples of Muscat and Malvaria wine, produced in different localities and of different vintages, two kinds of wine which are usually classed with the so-called "wines" that are characterized by a high sugar and extractive content and a relatively small content of alcohol, but about which authoritative information is very meagre. The average results of numerous analyses are the following figures for 100 Cc. of the respective wines :

	Muscat Wine.		Malvaria Wine.
Alcohol	11.49	Gm.	12.5
Extract.....	17.18	"	17.5
Total acid	0.6	"	0.6
Dextrose	13.81	"	13.8
Ash.....	0.357	"	0.357
Phosphoric Anhydride.....	0.0344	"	0.0344

Malvaria wine is not infrequently fortified with spirits. The relatively small content of phosphoric acid is an important characteristic of these wines.—Pharm. Ztg., Feb. 15, 1902, 131.

PAPAVERACEÆ.

Opium—Relative Quality of Commercial Sorts.—Collins has been endeavoring to subject the official sorts of opium to comparative examination. He finds that the Persian opium excels in purity and freedom from extraneous matter, being free from cellular tissues and epidermal fragments of capsules, poppy leaves, etc., while Egyptian opium, in strong contrast, is nearly always adulterated in the crudest manner with vegetable as well as mineral matter. In a general way, commercial opium may be divided into three grades or qualities : about 45 per cent. of the entire product is of prime quality, containing about 12 per cent. of morphine ; about 35 per cent. is of second quality, with 10 per cent. of morphine content, the rest being of third quality, containing from 7 to 8 per cent. of morphine only.—Pharm. Ztg., Feb. 15, 1902, 138 ; from Journ. de Pharm., Dec. 15, 1901.

Kwai Opium—Morphine Content.—Opium produced in Kwai has been examined by Thoms, who finds it to contain 12.5 per cent. of morphine, calculated on the dry substance, and 5.37 per cent. of water.—Pharm. Ztg., Mar. 12, 1902, 200 ; from Noztbl. d. Be.

Opium—Assay by an Improved Lime-Process.—In continuing his previous experiments on a method of opium assay, A. B. Stevens has made several important observations which have led him to propose the following method :

given below as being more satisfactory than the one previously recommended. He has found, in the first place, that by the pharmacopœial method of assay the results are liable to be too high owing to association with various impurities, and among these a substance behaving towards acid like morphine, but not morphine. Meconic acid was also found as impurity in 10 out of 11 samples when assayed by the pharmacopœial method, whereas none was found in the morphine obtained by the lime method. Instead of using C. P. calcium oxide, he now recommends the use of fresh lime, which may be slaked, but must not be air-slaked. The so-called C. P. can not be depended on—the ordinary burnt lime can. The method now proposed is as follows:

Take 4 Gm. of opium in fine powder and triturate in a mortar with 2 Gm. of fresh burnt lime (not air-slaked) and 10 Cc. of water until a uniform mixture results. Add 19 Cc. of water and stir frequently for half an hour. Filter through a dry filter, about 10 Cm. in diameter. Transfer exactly 15 Cc. to a 60 Cc. bottle. To this add 4 Cc. of alcohol and 10 Cc. of ether and shake the mixture. Then add 0.5 Gm. of ammonium chloride. Shake well and frequently during half an hour. Set aside in a cool place for twelve hours. Remove the stopper carefully and preserve, with any adhering crystals, for further use. Pour the ethereal layer into a small funnel, the neck of which has been previously closed with a piece of absorbent cotton. Rinse the bottle with 10 Cc. of ether, and when this has passed through, pour the contents of the bottle into the funnel. Without trying to remove all the crystals from the bottle, wash the bottle and contents of the funnel with morphinated water* until the washings are colorless. When the crystals have drained, place the funnel in the bottle containing adhering crystals, and with a small glass rod drawn out to a curved point, lift the cotton and rinse the crystals into the bottle with 12 Cc. of decinormal sulphuric acid, using the cotton on the end of the rod to detach any adhering crystals. Place the cotton in the bottle, replace the cork and agitate until the crystals are all dissolved. Rinse the cork and funnel with water and titrate the excess of acid with $\frac{N}{40}$ potassium hydroxide. The number of Cc. of decinormal acid consumed by the morphine, multiplied by 1.5038, will give the percentage of morphine obtained. To this add 1.12 for the morphine remaining in solution.—Pharm. Archiv., March, 1902, 41-45.

Opium—Convenient and Reliable Method of Assay.—Prof. L. E. Sayre, calling attention to the above method of opium assay proposed by Prof. A. B. Stevens, gives the results of his experience with it. He states that the process leaves little chance for error, is easy of manipulation, economical in point of time, and will give trustworthy and concordant results. In four different trials (on the identical sample) the yields of morphine were

* Water saturated with morphine ? Rep.

as follows: 13.33, 13.81, 13.57 and 13.76 per cent. Prof. Sayre believes, moreover, that the process may be considerably shortened by allowing the mixture of opium solution and ammonium chloride to stand four hours instead of twelve in a cool place, without vitiating the results of the assay. In the experiment, 13.07 per cent. of morphine was obtained from the same sample as that used in the previous assays. The use of a shaker for five hours or less probably would secure all the morphine. The greater portion of the morphine, perfectly white, springs into form and floats on and in the liquid in a few minutes after the addition of the ammonium chloride to the opium solution.—Drug. Circ., Sept., 1901, 180.

Opium—Modification of U. S. P. Assay Process.—Forest G. Stanford makes some practical suggestions concerning the U. S. P. process for assaying opium, which are particularly intended for the busy pharmacist. He observes that in this process it is the little things which require strict attention if we aim at accurate results. He points out that the addition of alcohol to the concentrated aqueous extraction of the opium causes a precipitation of inert matter, which, if not removed, will vitiate the result by increasing the apparent amount of morphine. He therefore recommends the following modification: "Evaporate the aqueous extract to 20 Gm., add 60 Gm. of alcohol, shake and filter, washing residue with a mixture of alcohol and water in the same proportions until the washings are no longer bitter, and then, after adding 35 Cc. of water, evaporate to 14 Gm. and proceed as directed in the U. S. P. from that point." Furthermore, after having added the ammonia, allow to stand twelve to fifteen hours, with occasional agitation, instead of six hours or over night, but not longer than twenty-four hours, because by that time inorganic salts present commence to precipitate. Another point to be observed is to be sure that the ether has all passed through and disappeared from the filter before endeavoring to transfer the morphine and mother liquor into the filter; otherwise, the filtration will be very much retarded.—Proc. Maine Phar. Assoc., 1901, 44-46.

Opium—Low Results of the Germ. Pharm. Process of Assay.—G. Fromme has compared the method of the Germ. Pharm. IV. for the assay of opium with other methods and finds it to give results which are 1.2 per cent. low. The result is that consumers will be obliged to purchase opium containing 12 per cent. of morphine that it may assay 10 per cent. when assayed by the official method.—Pharm. Rev., Dec., 1901, 554; from Cæsar & Loretz's Geschaefts-Bericht, 1901.

Opium—Importance of Excluding the Resinous Constituent from Its Preparations.—Frederick T. Gordon considers it conclusive that the nauseating and otherwise undesirable effects of opium and its galenical preparations are largely, if not entirely, due to the resin-like body, or mixture of resinous principles, contained in the drug, and that therefore

this principle should be excluded from all of its preparations. This may be accomplished very simply. In making extracts and tinctures from opium, use an aqueous menstruum, as this has been found to exhaust perfectly the desirable active principles of the drug, while it will dissolve only a small proportion of the resin of the drug. If, in making a tincture of opium, the granulated (far preferable to powdered) form be used, and this be macerated with the proper amount of *hot* water for 24 hours, all of the morphine and allied alkaloids will be dissolved, as will, too, the narcotine and some of the resin. If then we cool the drug and menstruum to about 10° C., and percolate it with cold water, much of the narcotine will remain in the marc along with the resin; and further traces of narcotine and resin can be removed from the percolate, if desired, by agitation with ether (as in the U. S. P. method), or by shaking the hot percolate, after concentration, with melted paraffin or even benzin. *Then* add the quantity of alcohol necessary to preserve the tincture or extract; never percolate opium with an alcoholic menstruum if you wish the resulting tincture to be free from the objectionable resin, for this body is quite soluble in diluted alcohol, and will be largely contained in your alcoholic tincture.—Merck's Rep., Sept., 1901, 279, 280.

Sanguinaria Canadensis—*Alkaloidal Constituents*.—Briefly reviewing the historical data connected with the investigations of blood-root and its alkaloidal constituents by Dana, Schiel, Probst, Riegel, Wayne, Hopp, Naschold and Henschke, König, and Tietz and Wintgen, R. Fischer communicates in detail the results of his own investigation, which confirm and establish the presence of four alkaloids in the rhizomes of *Sanguinaria canadensis*, namely: Chelerythrine, sanguinarine, homo-chelidone and protopine.

Chelerythrine, $C_{21}H_{17}NO_4$, as obtained by the described method, and after numerous recrystallizations from acetic ether colorless crystalline crusts together with a few isolated well-formed, colorless, rhombic crystals. When dried and in mass, the alkaloid exhibits a faint reddish tinge. The alkaloid melts at 203° C. It is sparingly soluble in acetic ether and in alcohol, more readily in chloroform, forming colorless solutions. It tenaciously retains some alcohol introduced in the course of its preparation, as already pointed out by König and by Tietz and Wintgen. Hence when crystallized from alcohol its formula must be given as $C_{21}H_{17}NO_4 + C_2H_5OH$. Experiments made with other solvents, benzol, toluol, etc., show that this alkaloid retains a portion of the solvent with great energy. Crystallized from toluol, and heated to expel the toluol retained, it had the composition $(C_{21}H_{17}NO_4)_2 \cdot H_2O$. Chelerythrine forms yellow salts, those of the mineral acids being characterized by their sparing solubility, particularly in excess of acid. The alkaloid is very sensitive to the action of acids, rapidly turning yellow when exposed to air.

Sanguinarine, $C_{20}H_{15}NO_4$, as obtained by the author, corresponds in all

respects with the alkaloid described by König. It is distinguished from chelerythrine by the deep-red color of its salts, its higher melting point (211°), its inferior crystallizability, and the forms of its crystals, which consist of fine needles arranged in tufts. Sanguinarine being with difficulty dissolved by acetic ether, its recrystallization was accomplished most conveniently with a mixture of chloroform and alcohol. Like chelerythrine, sanguinarine is liable to retain either alcohol or water, according to the solvent employed in its preparation and crystallization. The

Homochelidonine of Sanguinaria, $C_{21}H_{23}NO_5$, appears to exist, as pointed out by König, in two crystalline forms having identical analytical values, but differing in their melting points ($= 159^{\circ}$ and 169°). The author finds, moreover, that the homo-chelidonine of sanguinaria is identical with the chelidonine of *Eschscholtzia Californica* (which see). Furthermore, these two crystalline forms, designated by König, respectively β - and γ -homo-chelidonine, appear to be convertible into each other by the use of approximate precipitants or solvents. The composition $C_{21}H_{21}NO_5$, given by König is, however, not correct, but that above given. Finally, the fourth alkaloid of sanguinaria,

Protopine, $C_{20}H_{19}NO_5$, is identical with the protopine obtained by the author from *Eschscholtzia Californica*, and from *Glaucium luteum* (which see), as well as that obtainable from *Chelidonium majus*. Recrystallized from chloroform, it forms either warty aggregations of fine crystals, or well developed, strongly refractive crystals. It does not lose weight at 100° , and melts at 206° – 207° C. (uncorr.).—Arch. d. Pharm., 239, No. 6 (Aug. 18, 1901), 409–420.

Glaucium Luteum—*Alkaloidal Constituents*.—Dr. Richard Fischer has determined and examined the alkaloidal constituents in the root and herbaceous portions of *Glaucium luteum*, using for his investigations plants gathered during the flowering period. He isolated the alkaloid

Glaucine, $C_{21}H_{23}NO_4$, previously described by Probst, from the herb, but was unable to obtain it from the root. Glaucine forms pale yellow, well-developed, strongly refractive prisms and tables, often of considerable size, but so soft as to be removed with difficulty from the crystallizing flask without injury. It melts at 119° – 120° (uncorr.), becomes soft, without completely melting, in boiling water, is very sparingly dissolved by cold water, somewhat more soluble in hot water, difficultly soluble in benzol and toluol, much more readily in ether, and very soluble in alcohol, acetic ether, acetone and chloroform. It forms salts which are readily soluble in alcohol and in water, and these salts are tolerably resistant against the action of diffused daylight, but the impure preparations, particularly in solutions, soon become reddish-brown. Both glaucine and its salts should be preserved in well-closed vessels and protected from light. The herb also contains protopine, which is also a constituent of the root. The latter probably also

contains chelerythrine and sanguinarine, in small quantities, but neither root nor herb contain homochelidonine, which in this *papaveracea* appears to be replaced by the alkaloid glaucine. The protopine is identical with that isolated by the author from *Eschscholtzia californica* and from *Sanguinaria canadensis* (which see).—Arch. d. Pharm., 239, No. 6 (Aug. 18, 1901), 426–437.

Eschscholtzia Californica—*Alkaloidal Constituents*.—R. Fischer, operating upon plants gathered during the flowering period, has determined the alkaloidal constituents of *Eschscholtzia californica* to be, with certainty, protopine, and β - and γ -homochelidonine, which are identical with the same alkaloids described by him as being obtained from *Sanguinaria canadensis* (which see). It seems probable also that the plant contains small quantities of chelerythrine and sanguinarine; but the author's experiments seem to prove conclusively that morphine is *not* a constituent of *Eschscholtzia*.—Arch. d. Pharm., 239, No. 6 (Aug. 18, 1901), 421–425.

Chelidonium Majus—*Alkaloidal Constituents*.—Dr. M. Wintgen communicates the results of investigations undertaken with the object of clearing up the behavior of the principal alkaloidal constituent of *Chelidonium majus*, chelidonine, to reagents and to arrive at a more exact knowledge of its chemical constitution; the other alkaloids of celandine—protopine, chelerythrine, and β -homochelidonine—being incidentally subjected to similar study and investigation. He finds that

Chelidonine, $C_{20}H_{19}NO_5 + H_2O$, occurs in colorless monoclinic prisms, melting at 135° to 136° C. It cannot be titrated by the alkalimetric method with iodeosin, because the base is precipitated by the alkali before the end reaction is apparent. The author has prepared and describes monacetyl-chelidonine, monobenzoyl-chelidonine, monobrom-chelidonine, and chelidonine auro-chloride.—Arch. d. Pharm., 239, No. 6 (Aug. 18, 1901), 438–451.

Chelidonium Majus—*Botanical Description*.—Graham Bott gives an excellent description of the botanical characteristics of the greater celandine, accompanied by illustrations showing the root, leaf, inflorescence, fruit and seed of the plant, to which renewed attention is now directed because of its reputed efficiency in the treatment of cancer.—Pharm. Journ., Sept. 7, 1901, 317–320.

HAMAMELIACEÆ.

Hamamelis Virginica, L.—*Structure of the Stem Bark*.—A. E. Jensen gives an excellent general description of the different tissues in their respective positions, from the outside to the center, of the stem bark of *Hamamelis Virginica*, L., the bark used for his study being collected by Prof. L. S. Cheney in October, 1900. The paper, which is an abstract of the author's thesis, 1901, is accompanied by 8 plate illustrations, which

admirably depict the microscopic features of the bark.—Pharm. Arch., July, 1901, 121-123.

CACTACEÆ.

Californian Cactaceæ—Alkaloidal and Saponin Constituents.—Dr. George Heyl has made a chemical investigation of three Californian cactus plants, collected for him by C. A. Purpus, viz.: *Pilocereus sargentianus*, Orcutt; *Cereus pecten aboriginum*, Engelm; and *Cereus gummosus*, Engelm. A botanical description, illustrated by handsome full-plate half-tone prints, precedes the chemical description in each case. From

Pilocereus Sargentianus, a new toxic alkaloid, "*pilocereine*," was isolated. It is amorphous, melts at 85°–86° C., and has the composition $C_{20}H_{44}N_2O_4$. It forms amorphous salts, many of which are described, and the alkaloids precipitated from their solutions by all the usual alkaloidal reagents, except by tannin. Its physiological action upon rabbits and frogs has been studied by Heffer, who finds the toxic dose for rabbits to be 0.1 Gm. for 1000 Gm. of body weight, death being produced by heart failure without any paralysis of the central nervous system. In

Cereus pecten aboriginum a new base was also found, of the existence of which the author gives preliminary notice. It was obtained in form of a yellowish syrup, having a peculiar narcotic odor, which yields a crystalline hydrochloride and a crystalline platino-chloride. He proposes the name "*cereine*" for this new base. Examined physiologically, Dr. Heffer finds cereine to be powerfully toxic, resembling two other cactacea alkaloids, anhalonine and lophophorine, in its action. The lethal dose for rabbits was 15 centigrams for an animal weighing 2 kilograms. In the third cactus examined,

Cereus gummosus, no alkaloid was found, but it is very rich in a glucide resembling quillaic, polygallic, and ergotinic acids, which the author has named "*cereinic acid*." It is present to the amount of 24 per cent., calculated on the dry substance. The plant also appears to contain some sapotosin. Physiological experiments made with cereinic acid by Dr. Kobert show that the lethal dose, injected into the veins, is 100 Mgm. per Kgm. of the body weight of the animal.—Arch. d. Pharm., 239, No. 6 (Aug. 18, 1901) 451-473.

CUCURBITACEÆ.

Pumpkin-Seed Oil—Yield and Properties.—Willard Graham endeavored to prepare oil of pumpkin seed by expression, but failed to obtain appreciable quantities even under a pressure of 3,000 pounds. By extraction with acetone the ground seed yielded 25 per cent. of oil, clear reddish, limpid, and of agreeable odor and taste. Its sp. gr. at 15° C. was 0.9208; saponification number, 192.5; acid number, 18.9; ether number, 173.6; soluble in all proportions of carbon disulphide, ether, chloroform, and in

twenty parts of absolute alcohol, and drying on standing to a tough, yellowish, transparent mass. These properties and constants agree well with a commercial specimen, which was evidently also obtained by extraction. The latter, however, had a lower acid number, namely, 3.5, while the ether number was somewhat higher = 191.7.—*Amer. Journ. Pharm.*, July, 1901, 352.

PASSIFLORACEÆ.

Carica Papaya—*Enzymes of the Juice and Other Constituents*.—In the concluding installments of his very valuable and interesting monograph entitled “The Story of the Papaw” (see *Proceedings*, 1901, p. 723), F. B. Kilmer considers in detail the characters, composition and possible utility of the milky juice of the papaw-tree, and more particularly that which exudes when incisions are made into the rind of the fruit. Immediately after the incision is made the latex exudes very freely, but it quickly coagulates, and there is a slowing and eventual stoppage of the flow until another incision is made—though, under ordinary conditions, there may be a slow oozing of the latex through the initial incision for twenty-four hours or more. This rapid coagulation of the juice is attributed by the author to the presence of a clotting enzyme or pectin compound contained in it. As it exudes the latex is limpid, slightly denser than water, has a pronounced, disagreeable odor, suggestive of decayed meat, and a somewhat bitter, rather markedly astringent and acrid taste. If the coagulation of the latex is allowed to take place on the fruit, and the coagulation is allowed to dry on its surface, it becomes discolored and dark; but if the juice is removed as it exudes, spread out thin and quickly dried, a lighter-colored and better product is obtained, the yield being about 25 per cent. of air-dry substance, which still retains from 6 to 10 per cent. of moisture, while as much as 100 Gm. of latex is obtainable under favorable conditions from a single fruit. A further characteristic of this latex is its corrosive action upon the skin and mucous membrane, a property which it loses by treatment with chloroform and ether, or by the destruction of the irritant constituent in the process of separating the ferments or enzymes for which the latex is valued. Thus

Ferments of the Papaw are apparently quite numerous, the following being noted by the author:

1. A proteolytic ferment which decomposes proteids.
2. A coagulating (rennet-like) ferment which acts upon the casein of milk.
3. An amylolytic ferment having the power to attack starch, &c.
4. A clotting ferment similar to pectase.
5. A ferment possessing feeble power of action on fat.

The author reviews the various processes that have been suggested for preparing the commercial products known as “papayotin,” “para-

payotin," and "papain," but finds that these processes are as the method devised by himself for preparing juice in a concentrated form and free from the corrosive body above mentioned. The method follows :

Dry the latex without heat ; exhaust the dry residue then with chloroform, followed by benzin ; finally Under this process, if the extraction is thoroughly complete, is removed except the proteids and ash. The product is an amorphous powder, almost completely soluble in water, and is more nearly representative of the peculiar properties of the product resulting from any other method which has been made by the author's observation. The milky juice of the papaw is quite akin to the gastric or pancreatic juice of the animal. In a representative preparation the ferment action seen when all the proteids are associated together in the action of this ferment presents features which contrast with those of the ordinary digestive ferments. In its action the zyme of the papaw produces products which have a character quite different from those produced by tryptic and pepsin digestion. The action of the ferments on milk is quite identical to the action of ferment. First the act of curdling, in which the casein is separated as a curdulent precipitate, and this is followed by a digestion during which process they are converted into soluble amino-acids. The amount of starch-converting ferment is not large. A small portion of fresh latex to promptly act upon starch paste, thinning it into a portion at least into soluble starch and dextrine. The rennet ferment and the pectase probably present require further investigation. All in all the statement appears to be well warranted. The action of the ferments contained in the papaw latex is quite identical with that of animal ferments in general. Other constituents of the papaw —are a glucoside, *caricin*, and an alkaloid, *carpaine*. *Caricin* resembles *sinigrin*, and is obtainable, so far as the action is concerned, only from the seed, in which it is fairly abundant. The seed also contains the glucoside splitting ferment, *mysorin*. From one of the two a volatile pungent body is produced, suggestive of capsaicin in odor. The alkaloid, *carpaine*, has so far only been obtained from the leaves. Physiologically this alkaloid has the effect quite similar to that of digitalis.—Amer. Journ. Pharm. 1901, 336-48, and 383-395.

MYRTACEÆ.

Pomegranate Bark—Color Reaction.—H. Köhl

infusion of pomegranate bark, prepared cold by infusing 0.1 Gm. of finely powdered bark in 100 Gm. of distilled water for twelve hours and filtering, yields a faintly yellow colored filtrate which on the addition of ammonia assumes an intense yellow color, deepening and changing eventually to a red-brown. He attributes this color reaction to granat-tannic acid (of which it contains 22 per cent.) and considers it possible that it may be made available for the identification of the drug. A similar, but less intense reaction is obtained with kousso flowers (which see).

Pomegranate Bark — Percentage of Alkaloid. — Cæsar & Loretz ("Geschaefte-Bericht," 1901) report that different lots of pomegranate bark assayed according to the method of the Pharm. Germ. varied from 0.425 to 0.813 per cent. of alkaloidal content. Little difference was noted between the bark of the root and that of the branches if collected at the same time and place.—Pharm. Rev., Nov., 1901, 514.

Cloves—Detection of Stems in the Powder.—E. B. Kendrick points out that the stems of cloves contain chlorophyll in considerable quantity, whereas the clove-buds are free from it, and he utilizes this fact for determining the presence of stems in the powdered spice, as follows: A weak tincture of the suspected sample is made, and the absorption spectrum is examined for the characteristic bands of chlorophyll. Nearly all samples of cloves contain stems. These may be picked out, ground up, and used for purpose of comparison.—Pharm. Journ., Jan. 25, 1902, 62; from Analyst., 26, 291.

Eucalyptus Kino—A New Sort.—According to Mannich a new sort of kino, occurring in larger and lighter colored pieces, is now found on the market. It is derived from *Eucalyptus drepanophylla*, and is said to answer in place of Amboina kino.—Pharm. Ztg., Mar. 12, 1902, 200; from Notizbl. d. Berl. bot Ges.

ROSACEÆ.

Kousso—Chemical Constituents of the Flowers.—A chemical investigation of the constituents of kousso flowers by A. Lobeck shows that the formula recently given for *kosin* by M. Schatz, $C_{22}H_{30}O_7$, is incorrect and should be $C_{23}H_{30}O_7$; moreover, that *kosin* melting at 148° is not a single body, but that it consists of *α-kosin*, melting at 160° , and *β-kosin*, melting at 120° . He obtained from an ether-extract of the flower the constituents previously described by Leichsenring, namely, *protokosin*, m. p., 182° (not 176°); *kosidin*, m. p., 178° , and *kosotoxin*, m. p., 62° . Kosotoxin is a yellow powdery substance, which appears to have the composition $C_{62}H_{88}O_{20}$.—Arch. d. Pharm., 239, No. 9 (Dec. 13, 1901), 673–696.

Kousso—Color Reaction.—H. Kühl finds that an infusion of kousso prepared cold (in the proportion of 0.1 Gm. to 100 Gm. distilled water) is very faintly yellow in color, but on addition of $\frac{1}{1000}$ part of alkali, such as ammonia, potassium—or sodium hydrate it assumes an intensely lemon-

to orange-yellow color. As in the case of pomegranate bark (which see), the author attributes this reaction to a compound of the kousso-tannic acid with the alkali, and he believes it may be made available for the identification of kousso in powders, since a distinct reaction is obtained in fusions containing 1 part of the flower in 2000. The flowers are known to contain a high percentage of tannin (24 per cent. according to Willstein).—Pharm. Ztg., May 14, 1902, 378.

Bitter Almonds—Substitutes.—As is well understood, peach, plum, and apricot seeds are largely used for preparing expressed and volatile oils which are supplied as almond oils. Prof. Wittmack now calls attention to the substitution of these seeds for bitter almonds in confectionery and bakery. Botanically these seeds are so closely related as to afford scarcely any distinction; the anatomical distinctions are also insignificant; but while the taste of bitter almonds is a pleasant bitter, that of the substitutes is in nearly all cases unpleasantly bitter. Similar conditions prevail in their odor. Prof. Schaer, it appears, attributes these distinctions in odor and taste to a possible difference in the amygdalin.—Pharm. Ztg., Dec. 7, 1901, 975.

Strawberries—Salicylic Acid a Natural Constituent.—Heretofore it has now and then been pointed out that strawberry juice and wine, of undoubted purity, contained a substance that gave a violet reaction with ferric salts similar to that produced by salicylic acid; but the natural occurrence of the latter in the berries was disputed, the reaction being attributed to a tannin-like body. L. Porter and A. Desmoulières have now, however, determined with almost absolute certainty the existence of salicylic acid in ripe strawberries, and demonstrate this in a series of experiments upon ten different lots, which are described in detail and leave little doubt as to its natural presence. In all probability the acid occurs in these fruits in the form of salicylic acid methyl ester—Pharm. Ztg., Nov. 6, 1901, 890; from Journ. de Pharm., 1901, No. 9.

LEGUMINOSÆ.

Acacia—Criticism of Pharmacopœial Tests of Quality.—Lyman F. Kebler observes that the pharmacopœial tests for distinguishing between acacia of high quality and those of inferior quality or adulterated or spurious goods are unsatisfactory. Gums of inferior quality or poor grades are naturally contaminated more or less with certain reducing sugars. An attempt has been made to eliminate such contaminating substances by means of Fehling's Solution; but no directions are given for the application of this test, so the analyst is usually thrown back on his own resources. This is quite unsatisfactory. According to Allen's "Commercial Organic Analysis" and "Pharmacographia," the best gums do not reduce an alkaline cupric tartrate solution even when heated to boiling, but in Hager's "Handbook" we find it stated, in substance, that this test is too rigid,

inasmuch as all acacias reduce Fehling's Solution at a boiling temperature. This agrees with Mr. Kebler's experience ; he finds very little, if any, acacia at present available which will not reduce an alkaline copper solution at a boiling temperature, and many samples reduce such a solution at the ordinary temperature, but occasionally a sample is met with which does not have such a reducing action below 60 degrees C. With regard to the possible adulteration of acacia with dextrin, the author finds that the iodine test for dextrin is easily evaded, being suitable for only one kind of dextrin (erythro), inasmuch as the other kind of dextrin (achro) does not give a reddish color reaction with this reagent. Erythrodextrin, an intermediate product in the manufacture of achrodextrin, is colored reddish brown by iodine, but achrodextrin (a higher or purer dextrin) is turned a yellowish color with the same reagent. An aqueous solution of acacia is lævo-rotatory, while a similar dextrin solution is dextro-rotatory, which makes the adulteration easy of detection. The amount of volatile matter, 6 to 17 per cent., at 100° C., and an ash limit, 4 per cent., should be required. The viscosity is a very important factor, and can readily be determined by dissolving 100 Gm. in enough water to make 100 Cc., then ascertain the rate at which the solution flows through a glass tube with a small orifice. For comparison a similar solution made from a gum of high quality may be used.—Amer. Drugg., Dec. 9, 1901, 343.

Gum Arabic—Collection, Storage, etc., in Upper Egypt.—Writing from Assouan, Upper Egypt, Dr. H. C. Wood communicates some interesting information concerning the commercial history of gum arabic. This is now brought into Assouan, from the regions where it is collected, by rail instead of, as was formerly the practice, on the camel's back by caravan. It is bought of the natives by traveling merchants, sorted into three varieties, packed in large sacks made of palm leaf, and sold to the merchants of Assouan, who store it in roofless enclosures, containing many thousands of pounds, awaiting a favorable market. Dr. Wood was told that the gum is gathered sometime during the months of January, February and March, each collector having vested rights in a certain portion of the forest. Long incisions are made vertically through the bark and the exuding gum allowed to harden before gathering ; in this way, the trees not being injured, the collection can go on year after year. It is affirmed that in Upper Egypt the gum arabic tree flourishes when watered, but fails to yield gum. The finest variety of the gum is a very white, beautiful article.—Amer. Jour. Pharm., April, 1902, 201.

Gum Arabic—Water and Pentosan Content.—In the hope of establishing constants that might serve the purpose of differentiating between the ordinary and finer sorts of gum arabic, possibly also of determining their identity, R. Hefelman has ascertained the percentages of water and pentosan contained in the more important commercial varieties. Although failing to establish available constants, the results of his studies must be

regarded as a valuable contribution towards clearing up the chemical characters of gum arabic, particularly if considered in connection with the recent investigations of O. Fromm. By Hefelman's analytical data it is plainly demonstrated that the pentosan content of gums fluctuates in wide limits—from 20.65 per cent. in Australian gum to 51.21 per cent. in Argentinian, and that the higher values materially exceed those determined by Tollens and by the author in cherry gum, which are respectively 40.1 and 37.5 per cent. The percentage of pentosan, therefore, does not necessarily point to cherry gum as a possible adulterant of gum arabic with cherry gum; neither does the pentosan content afford a criterion of the commercial value of the gum. It is true that some of the gums containing small percentages of pentosan are found among the good and best commercial sorts; but others, containing equally low percentages, are found among the poorer. The percentage of water of the air-dry gums, which fluctuates between 8.5 and 17 per cent., affords no important criterion. The most adhesive and therefore best Kordofan gum contains a minimal percentage (29.6 per cent.) of pentosan, but Australian gum, which is known to possess the least adhesive properties of all the commercial sorts, contains still less (20.6 per cent.) of pentosan. On the other hand, Madras gum, which contains 46.33 per cent. pentosan, yields in the proportions of 1 : 2 a viscous and strongly adhesive mucilage, while Australian gum yields a thin fluid mucilage, similar to that of Barbary gum containing 37.7 per cent. of pentosan. As pointed out by Fromm, the commercial value of gums does not depend exclusively on its adhesive qualities, but also on the color of the crude gum and of its solutions. Gums that combine good adhesiveness with light color are of greater commercial value than those forming dark solutions. The most reliable technical test is that established by the viscosimeter.—*Pharm. Ztg.*, July 13, 1901, 563; from *Ztschr. f. öffentl. Chem.*, 1901, No. 11.

Senna Leaves—Proposed Test of the Pharm. Helv.—The Swiss Pharmacopœia Commission, after an accurate macroscopic and microscopic characterization of senna leaves, gives the following test: 0.5 Gm. coarsely powdered senna leaves are boiled for two minutes with 10 Cc. of 10 per cent. alcoholic potassa solution, the solution mixed with 10 Cc. of water and filtered; the filtrate is acidulated with hydrochloric acid and shaken out with ether. On shaking the ether with ammonia, it acquires a yellow-red color.—*Pharm. Ztg.* Mar. 10, 1902, 220.

Take of whole senna or senna cut small, or powdered senna No. 30, or powdered senna No. 60, or powdered senna No. 80, 1,000 Gm. Moisten the senna with 400 Cc. of alcohol, and pack it in a convenient percolator. In packing, whole-senna should receive the greatest amount of pressure. The cut senna about the same amount. No. 30 powder almost the same; while for No. 60 powder the pressure should be appreciably reduced, and the same for No. 80 powder. In moistening the powders lumps should be avoided so that a homogeneous marc may form in the percolator, which will then be penetrated by the menstruum in a horizontal line. After packing, add the alcohol to saturate the senna and leave a stratum above it. As soon as the percolate appears at the lower orifice, close it, and having covered the percolator air tight, if possible, macerate for forty-eight hours. Then percolate until 4,000 Cc. are obtained, or rather percolate until 3,500 Cc. are obtained, and express the senna, which may yield from 350 to 500 Cc., or more. Mix the two liquids and place aside for distillation. The senna is then removed from the percolator and allowed to dry, preferably in a drying chamber. It should be kept with ordinary care. In this process not more than from 250 to 400 Cc. of alcohol need be lost, and the senna is pretty thoroughly deresinated and deprived of most of the nauseous odor characteristic of the crude drug.—Amer. Drug., Sept. 9, 1901, 140.

Cassia Abbreviata, Oliv.—*The Root an East African Remedy for Black-water Fever*.—E. M. Holmes calls attention to specimens of a large root recently presented to the museum of the Brit. Pharm. Society, which is used by the natives of the east coast of Africa as a specific for haematuria and black-water fever, a form of malarial fever which so often proves fatal to Europeans. It has been used by and is favorably reported on by missionaries and European medical men in East Africa. Mr. Holmes identified the root, from specimens of leaf and flower accompanying it (which are shown in illustrations accompanying his paper), to be derived from *Cassia abbreviata*, Oliv. The mode of administering the drug is as follows: The root is chopped into pieces about one inch in length, and of these pieces six or twelve are boiled in a gallon of water for half an hour. The patient drinks of the red-colored decoction, either hot or cold, as often as he feels thirsty, or if he does not suffer from thirst, a teacupful is given every three or four hours.—Pharm. Journ., Nov. 30, 1901, 616.

Since the above note of Mr. Holmes was published, Dr. O'Sullivan Beare, of Pemba, the English medical man who had originally sent the drug to England, has brought to the museum a mature pod of the plant and some seed, flowers, and leaves of the tree yielding the root employed as a remedy for black-water fever, as described. Mr. Holmes now states that from the characters of the pod, it is certain that the plant is not identical with the *Cassia abbreviata*, Oliv., as he had previously supposed, judging from the leaves and flowers alone, although it differs from it in

little except in the pod and the shape of the seed. He regards it to be a distinct species, for which he proposes the name

Cassia beareana, n. sp., after its discoverer, Dr. Beare, and gives a description of the tree, its foliage, inflorescence, and fruit from information received and the material supplied. The present paper is accompanied by cuts showing the characteristics of the fruit and seeds, and also of the seeds of *C. abbreviata*.—Pharm. Jour., Jan. 18, 1902, 42.

Robinia Pseud-Acacia, L.—*Chemistry of the Bark*.—Frederick B. Power, referring to a previous investigation on the chemical constituents and poisonous principles of the bark of the common locust, *Robinia pseud-acacia*, L., undertaken by himself and Mr. J. Cambier (see Proceedings, 1890, 489), has again taken up the investigation with the object of further inquiry into the nature of the proteid substances previously described and to examine more closely the other constituents of the bark. The conclusions reached by the author's present very exhaustive investigations are briefly as follows :

1. The bark contains a poisonous proteid,

Robin, which has the following general properties : It has an acid reaction, is soluble in water and in salt solutions, and is precipitated from its solution by acids. On heating its aqueous solution it becomes coagulated, although not at a uniform temperature, the largest amount being precipitated between 70° and 80° C. ; at the temperature of a water-bath its toxic action is completely destroyed. It affords all the color reactions of albuminous bodies, and is precipitated by all the commonly-employed reagents. The ash obtained by the ignition of the precipitated proteid contains a considerable amount of iron. All of these reactions appear to be in complete accordance with the accepted characters of a *nucleo-proteid*. The proteid, when prepared by precipitating a cold concentrated aqueous infusion of the bark with strong alcohol, has furthermore the properties of an enzyme, or contains such a body associated with it. Inasmuch as it is capable of effecting the hydrolysis of both amygdalin and potassium myronate, with the formation respectively of bitter almond oil (*i. e.*, benzaldehyde and hydrocyanic acid) and mustard oil, it appears to resemble the ferment *myrosin*. Like the rennet ferment it is capable of coagulating the casein of milk, a property which, as Dr. Carl Lau has recently shown, is possessed also by the other toxic proteids—ricin, abrin and crotin—and like them it also has the property of clotting the red corpuscles of the blood of certain animals.

2. The bark contains one or more substances of an alkaloidal nature, which are easily decomposed, even by so weak an alkali as silver hydroxide, with the evolution of ammonia and small amounts of an amine. Although these bodies cannot at present be more definitely defined, owing to the difficulties of their isolation in a pure state, it is very probable that they represent degradation products of the proteid.

3. By the hydrolysis of an extract of the bark with hydrochloric acid, a small amount of a crystalline substance has been obtained, agreeing in composition, melting point, and other properties with *syringic acid*, $C_9H_{10}O_6$, together with a red, amorphous substance corresponding to *syringenin*. There is likewise formed by the hydrolysis a dextro-rotatory sugar, the osazone of which has a melting-point agreeing with that of *d*-glucose. These related facts would seem to indicate the presence in the bark of the glucoside *syringin*, $C_{17}H_{24}O_9$. On the other hand, it may be observed that syringic acid is not a product of the direct hydrolysis of syringin, but is formed by the hydrolysis of an intermediate substance resulting from the oxidation of syringin—namely, *gluco-syringic acid*, $C_{15}H_{20}O_{10}$, and there is therefore the possibility that this latter substance may also pre-exist in the bark.

4. The bark contains, furthermore, a small amount of tannin, some amorphous coloring matter, a sugar—probably *d*-glucose—and a considerable amount of fatty matter and resin. The resin, as previously shown, is devoid of any marked physiological action, and also possesses no special chemical interest. In view of the conflicting statements concerning the toxic effect of the

Leaves of Robinia Pseudo-Acacia when eaten, these being recorded in some of the older works as affording a wholesome food for cattle, the author has made a few experiments, which, although not conclusive, point out that they do not contain a soluble proteid, such as exists in the bark, nor did appropriate tests give any indication of the presence of an alkaloid.—Trans. Brit. Pharm. Conf., 1901, 349–372.

In connection with the foregoing a very complete description of the anatomical structure of the bark of *Robinia pseudo-acacia*, L., is given in a paper communicated by Pierre Elie Felix Perrédès; this paper being illustrated by three handsome plates exhibiting in eighteen figures the characteristic elements of the bark.—*Ibid.*, 372–383.

Catechu—Percentage Insoluble in Alcohol.—The Pharm. Germ. IV, requires that the residue remaining after extracting catechu with alcohol should not exceed 15 per cent. K. Dieterich points out that this requirement is too stringent, and recommends 30 per cent. as the limit of insoluble residue. The residue in six examinations of Pegu-catechu varied from 25.71 to 41.86 per cent. Catechu conforming to the present official requirement is rarely found in the market.—Pharm. Centralh., Aug. 1, 1901, 464; from Helf. Annal., 1901.

Catechu—Constituents.—A. G. Perkin and E. Yoshitake give the results of an investigation of the constituents of gambier and acacia catechus, which has been in progress for more than two years. The gambier catechu employed was found to contain two catechins (*b*) and (*c*), while a third (*a*) has been isolated from the acacia catechu examined. Catechin (*b*),

$C_{15}H_{14}O_6 \cdot 4H_2O$, occurs in air-dried, colorless needles, corresponds in its melting point, $175^\circ-177^\circ$, with Gautier's (*b*) catechin, and gives, on fusion with alkali, phloroglucinol, protocathechuic acid, and an acid resembling acetic acid. Catechin (*c*), $C_{15}H_{14}O_6$, air-dried, contains no water of crystallization, and forms colorless prisms (m. p. $235^\circ-237^\circ$). It has been found in minute quantity only and yields phloroglucinol and protocathechuic acid on fusion with alkali. Catechin (*a*), $C_{15}H_{14}O_6 \cdot 3H_2O$ (or less probably $C_{14}H_{14}O_6 \cdot 3H_2O$) air-dried, forms colorless needles and corresponds in its melting point ($204^\circ-205^\circ$) with Gautier's (*a*) catechin. Fusion with alkali gave phloroglucinol, protocathechuic acid, and an acid resembling acetic acid. Cyanomaclurin, a constituent of *Artocarpus integrifolia*, has been found to contain a phloroglucinol group, and is probably isomeric with the catechins described.—Pharm. Journ., June 21, 1902, 530; from Proc. Chem. Soc., 18, 139.

Copaibas—Character of the Resins.—Edward Keto has made a chemical investigation of the character of the resins in the different sorts of copaiba, his investigations including two samples of "Maracaibo"—one of "Para," and two of the "African" variety of copaiba, the second sample in each of the two cases mentioned being sedimentary deposits. A description of each of the samples, which are of authentic source, is given, but the only one of interest here is that of the African variety of copaiba, designated as

Illurin Balsam. This is said to be derived from *Hardwickia*, Mannii, collected in the Niger basin of west Africa. It was not completely transparent, of a saturated brown color, had a strong green fluorescence, and a thick-fluid consistence somewhat like that of Maracaibo balsam. The odor was peculiarly aromatic, somewhat empyreumatic, and entirely different from genuine copaiba. The taste, at first insipid, then bitter and acrid. Its sp. gr. was 0.9905, the acid number, 55.5; ester number, 8.3; iodine number, 167.1. It mixes clear with chloroform, benzol, toluol and with a little ether, but with an excess of the latter becomes opalescent. With an equal volume of petroleum ether, a clear solution is formed, but with an excess strong precipitation is produced. Alcohol, absolute as well as 95 per cent., acetone and glacial acetic acid, produce turbid mixtures, which do not become clear on adding an excess of the solvent. Flücker's reagent did not produce a red color.

The results of these investigations may be briefly summarized as follows: The copaivas and the Illurian balsams exhibit a great resemblance to the oleo-resins of the coniferæ (Coniferenharzbalsamen), and like these are composed of mixtures of volatile oils, resenes, so-called resin acids and small quantities of bitter substance. These bodies are so intimately associated in the one in the solution of the other so easily soluble, that it becomes impossible to ascertain their relative properties. The volatile oils undoubtedly constitute the preponderating quantity, the indifferent

resins (resenenenes) are present in small proportions, and the resin acids vary from 10 per cent. in *Para copaiba*, to 30 or 40 per cent. of the entire balsam in *Maracaibo copaiba*. The *Illurin* balsams conform so closely to the genuine *copaiba* that it seems probable that they are derived from a closely related plant. The following crystallizable resin-acids were obtained and studied :

1. *Paracopaivic acid*, $C_{20}H_{22}O_3$, forming pointed and quadratic leaflets, melting at 145° – 148° C., and soluble in ammonium carbonate solution. Occurs in *Para copaiba*.

2. *Homoparacopaivic acid*, $C_{18}H_{28}O_3$, occurs in pointed needles, melting at 111° – 112° C., and insoluble in ammonium carbonate solution. Occurs also in *Para copaiba*.

3. *Metacopaivic Acid*, $C_{11}H_{18}O_2$ (possibly $C_{16}H_{24}O_2$ or $C_{22}H_{32}O_4$), crystallizing in pointed prisms, melting at 89° – 90° C. Obtained from *Maracaibo copaiba*.

4. *Illurinic Acid*, $C_{20}H_{28}O_3$, crystallizing in hexagonal pyramids or leaflets, melting at 128° – 129° C. Present in *Maracaiba copaiba* and in *Illurin balsam*.—*Arch. d. Pharm.*, 239, No. 7 and 8 (Sept. 17 and Oct. 30, 1901), 548–581.

Copaivera Bracteata—*Constituents*.—E. Kleevekooper has isolated from the so-called “purple-wood” (*Copaivera bracteata*) a colorless proximate principle, which he has named

Phænin.—It occurs in the parenchyma cells of the seed, has the composition $C_{14}H_{16}O_7$, and is characterized by producing an intense red color when tested with hydrochloric acid, this color being due to its conversion into *Phænicëin*, $C_{14}H_{14}O_6$, the formation of which depends on the splitting off of 1 mol. of water.—*Pharm. Ztg.*, Nov. 6, 1901, 889; from *Nederl. Tijdschr. v. Pharm.*, Aug. and Oct., 1901.

Indigofera—*Synonyms Applied to Indigo-yielding Species*.—D. Train and E. Baker have made a series of investigations with the primary object of elucidating the synonyms of the indigo-yielding species of the genus *indigofera*, including incidentally some other species, and have come to the following conclusions: *Indigofera tinctoria*, L., has been applied to three forms: (1) The wild form, which is probably indigenous to Africa; (2) the variety of the previous one, cultivated in southern India, at the present day more especially in Madras; (3) the plant cultivated in northern India, known as “Nil”; the differences between this and the other cultivated variety are so pronounced and constant that it seems justifiable to separate it off, when it becomes *I. sumatrana*, Gaertner. The specific name *anil*, also given by Linnæus, is connected with the Egyptian vernacular word “Nil,” which indicates any species that supplies the indigo dye. In Egypt the word “Nil” would refer to *I. articulata*, Gouan, in India to *I. tinctoria*, L., while in neither of these countries

would it include *I. anil*, L., which will not grow in Egypt find favor in southern India. De Candolle instituted three varieties of *I. anil*, L., of which variety α -*oligophylla* is the same plant as *I. anil*, L., which was probably cultivated in the West Indies. Hans Sloane, while variety β -*polyphylla* is the plant now cultivated in the West Indies and other parts of the New World. This is *I. anil*, L., but to avoid any confusion which may arise from the same specific name, it is suggested that it should be established, as a synonym, as *I. suffruticosa*, Miller.—Pharm. Journ., May 1890; Journal of Botany, 40, 50 *et seq.*

Indigofera Tinctoria—*Indican Content and its Conversion*—In an address delivered by A. Schulte in Hofe before the Pharmaceutical Society, he demonstrated the interesting fact that the conversion of indican into indigo-blue is not accomplished, as is supposed, by micro-organisms, but is due to the presence of an enzyme. As a matter of fact the yield of indigo is greater if the plants are grown at a higher temperature—50° to 65° C., or even higher—instead of at 20° C. in water; certain limits must not be exceeded, otherwise a portion of the indican as well as the enzyme are liable to be decomposed. The yields of indigo-blue, namely, 0.121 per cent., were obtained from the plants to extraction at 53° C. during two hours. The yield is also dependent on the period of growth and the locality where the plant is grown. They appear to contain the largest amount of indican in May and June, but even here variations amounting to as much as 50 per cent. were noticed, due to the character of soil, rapidity of growth, greater or less exposure to sunlight. The author's studies, which are consulted in the original, point out that numerous important questions concerning the cultivation as well as the manufacture of indigo must be solved. The study of rational methods of cultivation promises to increase the yield of indigo from the plants; but no improvements in the present method are likely to surmount the advantages that have been gained by the artificial production of this valuable dye-stuff.—Pharm. Ztg., 1901, 108; from Ber. d. D. Pharm. Ges., 1902, No. 1.

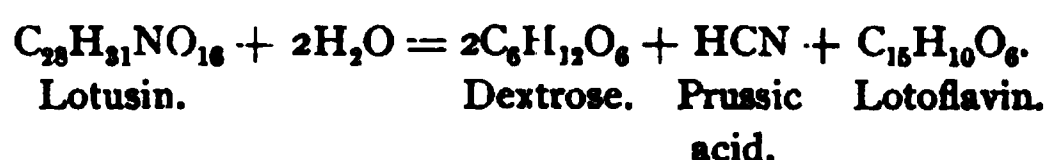
White Balsam of Peru—*Proximate Examination*.—Gehlen subjected white balsam of Peru, which, as is known, is obtained by the distillation of the fruits of *Myroxylon Pereira*, to physical and chemical examination. The balsam is light yellow, in large bulk yellowish, color, has the sp. gr. 1.082 at 19° C., and constitutes a thick liquid having a pronounced odor of storax and melilot. It forms a clear solution with chloroform or carbon bisulphide, but turbid solution in alcohol, ether, or oil of turpentine. Its acid number is 30. It dissolves 89.47 per cent., the portion insoluble in it being identical with the myroxocerin described by Germann. It is a tough, wax-like substance, which after drying dissolves in

forming a neutral solution, and melts at 120°C . The alcoholic extract has the acid number 34.1 and the saponification number 175.5, and it contains the myroxoresen and myroxol of Germann, the former remaining undissolved (13.26 per cent.) when the alcoholic extract is shaken with 1 per cent. soda solution, while the myroxol is precipitated by strong soda solution from its solution in dilute soda. Besides these constituents the balsam was found to contain free cinnamic acid, cinnamic acid ester, and 9.5 per cent. of an acid resin having the acid number 174.85—Pharm. Ztg., May 10, 1902, 365; from Gehe & Co.'s Bericht, April, 1902.

Tolu—*Solubility in Carbon Disulphide*.—K. Dieterich (Helf. Annal., 1901) calls attention to the inaccuracy of the Pharm. Germ. IV. requirement of insolubility of balsam of tolu in carbon disulphide. As already noted by Gehe, genuine balsam will yield 25 per cent. of its weight to CS_2 . An adulteration with colophonium, practiced for the purpose of producing a "hard balsam," can, therefore, not be determined with certainty by the official method.—Pharm. Centralh., Aug. 1, 1901, 464.

Lotus Arabicus—*Poisonous Constituent*.—In continuation of previous experiments, Professor Wyndham R. Dunstan and T. A. Henry, report the results of their investigation of the poisonous constituent of *Lotus arabicus*. This is

Lotusin, a yellow crystalline glucoside, which furnishes prussic acid as a decomposition product. It is more soluble in alcohol than in water. When heated it gradually decomposes without exhibiting any fixed melting point. From combustions the formula $\text{C}_{28}\text{H}_{31}\text{NO}_{16}$ is deduced, and its hydrolysis is represented by the equation:



When warmed with aqueous alkalies lotusin is gradually decomposed, ammonia being evolved, and an acid formed, to which the name lotusinic acid ($\text{C}_{28}\text{H}_{31}\text{O}_{16}$) has been given. This is a monobasic acid furnishing yellow crystalline salts. With the exception of amygdalin, lotusin is the only glucoside definitely known which furnishes prussic acid as a decomposition product.—Chem. News, July 19, 1901, 26.

Picidia Erythrina—*Chemical Constituents*.—According to P. C. Freer and A. M. Clowe, the picidin heretofore described as a constituent of Jamaica dogwood, is not a single body, but consists chiefly of a mixture of two crystalline bodies, one melting at 215° , the other at 201°C . From the aqueous extract the authors have isolated an acid

Picidinic Acid, $\text{C}_{11}\text{H}_{12}\text{O}_7$, which exists in the bark in the form of soluble lime salt. It separates in glutinous masses from aqueous solution, but crystallizes from chloroform, ether or from methylpropyl ketone in crystals,

melting at 182° – 185° C. It is dibasic, and resembles mucic or saccharic acid in its properties. It forms the monomethyl ester $C_{11}H_{11}O_6 \cdot C_2H_5O$, which occurs in glittering needles, melting at 207° – 208° C. Its neutral solutions are not precipitated by copper or barium, but the silver salt is a white insoluble precipitate. It gives no evidence of containing methoxyl groups by Zeisel's method, nor is it methylated, nor acted on by hydrobromic acid, nor does it give any derivatives of the aromatic series. It gives a dibromo additive compound, probably $C_{11}H_{11}O_7Br_2$, in bright colorless needles, melting at 234° – 236° C. The chloroformic extract of the bark gives three crystalline bodies, a substance occurring in colorless needles, melting at 150° – 155° C., and having the empirical formula $C_{20}H_{22}O_7$; a body separating in large colorless prisms melting at 201° C., having the formula $C_{21}H_{22}O_5(OCH_3)_2$, and a third body separating in yellow needles, melting at 216° C., having the constitution $C_{20}H_{12}O_4(OCH_3)_2$. The so-called

Picidin of previous workers is probably a mixture of these last two substances. After separating the above, a glucosidal body is precipitated from the mother liquor by the addition of petroleum ether, which melts at 50° – 80° C. On hydrolysis this yields the crystalline body, melting at 216° C., and the solution reduces Fehling's reagent. Petroleum ether extracts from the bark, as well as the two above-mentioned crystalline bodies, a third substance, which, recrystallized from alcohol, melts at 159° C., and occurs in colorless monoclinic prisms.—Pharm. Journ., Oct. 26, 1901, 473; from Amer. Chem. Journ., 25, 390.

Spartium Junceum—*Substitution of the Flowers for those of the Common "Broom."*—A series of cases of poisoning has occurred in France through the substitution of the flowers of the Spanish broom, *Spartium junceum*, for those of the common broom, *Sarothamnus scoparius*. E. Perrot states that this substitution is frequently practiced, and that dried broom flowers on the Continent are often composed of the flowers of *Spartium*. He points out that this substitution is dangerous, since although but little is known of the chemical constituents of the Spanish broom, it is found to be at least five or six times more active than *S. scoparius*. That the plant is very toxic is evident from the fact that each packet of mixed herbs which occasioned the trouble only contained 5 or 6 Gm. of broom flowers, which was sufficient for a liter of infusion, and a portion of this tea gave rise to violet vomiting and purging. The flowers may be readily differentiated by the following characters: *Sarothamnus scoparius*: Calyx small, bell-shaped, with two unequal lobes, the upper bidentate, the lower with three small teeth; style always rolled. *Spartium junceum*: Calyx deeply cleft to the base on one side only; style curved, not rolled.—Pharm. Journ., July 27, 1901, 89; from Journ. Pharm. Chim. [6], 14, 19.

TEREBINTHINACEÆ.

Myrrh—Modification of the Official (B. P.) Test.—In order to distinguish myrrh from its possible admixtures, adulterants, or substitutes, such as bdellium, hotai, bissabol, &c., the B. P. mentions that when myrrh is moistened with nitric acid, it assumes a violet color, while bdellium and other false myrrhs do not—Henry G. Greenish, finding this test unsatisfactory, principally because it is not sufficiently delicate to bring out the violet color distinctly. The author reviews the tests required by other pharmacopœias with the same object, as well as those proposed by various authorities. It will suffice here to mention that he regards the U. S. P. test, addition of nitric acid to the alcoholic solution, to be deficient owing to a lack of detail, while to the G. Ph. test—exposure of the ethereal solution to the vapor of bromine—he objects on the ground of inconvenience in handling bromine, and because of the liability of obscuration by the possible solution of some of the bromine. He accordingly experimented, using ligroin, carbon-disulphide, ether, and alcohol as solvents, nitric acid and bromine to produce the reaction. He found, in the first place, that nitric acid answers the purpose just as well as bromine; then, that the best coloration is obtained with the ligroin (or petroleum spirit) solution of the gum-resin; but that for practical purposes ether answers best, since it is easily obtained in a pure condition, and disintegrates the gum resin more readily. The test should be carried out as follows to insure accurate results: Half a gramme of coarsely powdered myrrh, occasionally shaken during 10 minutes, with 10 cubic centimeters of ether, should afford a filtrate, 2 cubic centimeters of which should yield, when evaporated, a residue that is slowly colored violet by contact with the vapor of nitric acid. In the author's experience all samples of true myrrh give this reaction. In the case of two old samples the reactions were indistinct. Neither bissabol, of which three specimens were subjected to the test, nor other false myrrhs, such as bdellium, hotai, &c., give the reaction.—Pharm. Journ., Dec. 14, 1901, 666, 667.

Semecarpus Venenosa, Vlkls.—*Poisonous Constituent of the Bark.*—Thoms and Mannich have subjected the bark of the "tschongott-tree," *Semecarpus Venenosa*, Vlkls., to chemical examination, which, although incomplete, leads to the presumption that the highly poisonous properties of this bark are due to cardol (anacardic acid). The tree is a native of the Caroline Islands, the specimens of bark examined being derived from the island of Yap, and it is said to be so highly poisonous that the rain water dropping from the tree is capable of producing eruptions and festers on the skin, which has been wetted with it.—Pharm. Ztg., Feb. 19, 1902, 139.

Semecarpus Anacardium.—Presence of a poisonous alkaloid, *chuchuarine*, which see under "Organic Bases."

juice of the Samoan tree called "Mafoa" or "Maali." In its appearance, consistency, solubilities, and odor (reminding of turpentine and fennel oil), the juice presents the characters of elemi; but the author was unable to obtain from it a body identical with the amyris, the characteristic constituent of Manila-elemi, though one possessing a chemical resemblance to it. Further investigations are necessary to determine the precise nature of this constituent.—Pharm. Ztg., Feb. 19, 1902, 140.

PIPERACEÆ.

Pepper—Adulteration with the Fruits of Myrsine africana and of Embelia ribes.—A. Mennechet describes the macroscopic characters, as well as the microscopical appearance of the elements, of the fruits of *Myrsine africana* and of *Embelia ribes*, which are used as adulterants of pepper. In addition, he mentions a simple chemical test which allows this admixture to be readily detected. A portion of the powder is extracted by maceration, or percolation, with ether. To the ethereal solution, a little water is added, followed by a few drops of ammonia. On shaking, a deep lilac-red coloration is obtained in the aqueous layer if either of the above-named fruits be present. Pure pepper gives no color.—Pharm. Jour., Jan. 25, 1902, 61; from Journ. Pharm. Chim. [6], 14, 587.

EUPHORBIACEÆ.

Jatropha Angustidens, Müll.—*Prussic Acid Content of the Rhizome.*—G. Heyl has determined that the rhizomes of *Jatropha angustidens*, Müll., a plant flourishing and widely distributed in Mexico, contains about 0.108 per cent. of hydrocyanic acid.—Pharm. Ztg., June 11, 1902, 458.

Donde-Caoutchouc—Botanical Source.—In continuation of his interesting reports on the cultivation and source of caoutchouc in German East Africa, Walther Busse gives a description of the plants yielding it in Donde-land. Besides the plantations of *Manihot Glaziovii* now existing, experiments are being made with a West African plant, *Landolphia Hendelotti*; but the author expresses the opinion that the demands of this plant for specially adapted soil and moisture may prove a decided hindrance to its successful introduction. He has therefore suggested the experimental introduction of another species of *Landolphia*, which he names *Landolphia dondenensis*, a shrubby plant from which the celebrated donde-caoutchouc is obtained—this plant accommodating itself, in his opinion, to the conditions of soil and climate prevailing in the German East African colonies. This plant, however, possesses a close resemblance to the comparatively worthless *Landolphia parviflora*, K. Sch., and the author therefore gives an accurate botanical description of the two plants in his present contribution, which must be consulted in "Tropenpflanzen," 1901, No. 9.—Pharm. Ztg., Oct. 23, 1901, 849.

Para Caoutchouc—Conservation of the Latex.—At the meeting of German Naturalists and Physicians, 1901, Dr. Schneider exhibited several kilograms of the latex of Para-caoutchouc, collected in 1899, which had been preserved perfectly by the addition of very small quantities of ammonia and creosote. On precipitating it with citric acid, an extremely tenacious and colorless caoutchouc was obtained from this latex.—Pharm. Centralh., Dec. 19, 1901, 807; from Chem. Ztg., 1901, 924.

Madagascar India Rubber—Plants Yielding It.—Jumelle has investigated the source of Madagascar india rubber, and finds that the plants yielding it belong to the genus *Landolphia* and *Mascarenhasia* of the Apocynaceae and to the *Marsdenia* and *Cryptostegia* of the Asclepiadaceae. Each species yielding caoutchouc is very fully described in its external morphology, its internal anatomy, and in the character of its latex. He finds the india rubber yielded by the *Landolphias* to be pink in color, of low specific gravity, with but little admixture of resins (6.8 per cent.), and very free from mineral substances. From the *Mascarenhasias* the india rubber is black, of high specific gravity, very free from resin (3–5 per cent.), and has a larger amount of mineral admixture. The caoutchouc from *Marsdenia* and *Cryptostegia* is very inferior. The latex of *Mascarenhasia lisianthiflora* contains 40 per cent. of caoutchouc, of *Landolphia sphærocephala*, 20 per cent., and *L. perrieri* about 10 per cent.—Pharm. Journ., Mar. 15, 1902; from Bonnier's Revue Gen. de Bot., 13, 289.

Chinese Wood Oil—Suggestions Concerning Its Use and Cultivation in Other Countries.—Augustine Henry draws attention to the useful properties of Chinese wood-oil, and points out that the tree which supplied it, *Aleurites cordata*, indigenous to China and Japan, should be cultivated in certain British colonies—in Ceylon, the Nilgiris, in Natal, and in the mountainous parts of the West Indies—and in the United States. He says in regard to this valuable oil, that when traveling on the Yangtse above Hankow, nothing is more pleasing to the European than the sight of the fleets of beautiful junks which sail up the river to enter the lake in Hunan. They are marvellously clean, and their sides glisten in the sun like mirrors. These boats are coated over with wood-oil, which is the universal substitute for paint in Central China. The timbers of boats and the woodwork of houses are preserved by this remarkable substance, which is called *f'ung yu* by the Chinese, and the bright surface of the junks varnished with it enable them to withstand the friction of the swift currents of the river. The Chinese extract the oil from the seeds by rude wooden presses with wedges. Hankow is the great Chinese market for the oil, and it arrives there from the country districts in tubs fitted with tight-fitting lids. It is then exported to all parts of China. The Chinese distinguish two kinds of the oil, black and white. *White f'ung oil* is cold-drawn, and is a yellow, transparent, moderately thick oil, used in Central China for varnishing furniture and

umbrellas, for lightning-purposes, and for making is largely planted in different parts of China, the supply in China is probably only large enough for native consumption. Demand for the oil from abroad would undoubtedly be great soon. Once the useful properties of the oil are generally known, consumption in the arts may become very considerable. May 31, 1902, 873.

Dorstenia—*Chemical Constituents*.—E. Heckhauffen have investigated the chemical constituents of *Dorstenia*. In the root of the Gaboon ivy, *Dorstenia*, they found a coumarin body, having the composition $C_{12}H_8O_3$, which they have named "pseudo coumarin." It has a strong odor, and was obtained from the petroleum-ether extract. The root yielded a resin and tannin. From the petroleum-ether extract of the root of *Dorstenia brasiliensis* a crystalline body was obtained, but devoid of the coumarin odor, and from the alcohol extract a similar to that from *D. kleineana* was also obtained. Neither the root of *D. brasiliensis*, nor *D. yerva*, have the coumarin-like odor characteristic of *D. kleineana*. Pharm. Centralh., Jan. 30, 1902, 70.

"*Tua-Tua*"—*A Hawaiian Remedy in Leprosy*.—"Daily Mail" (Feb. 8, 1902) the plant which is believed to be a remedy for leprosy with some beneficial results, and is said to be native to Venezuela, is probably

Jatropha gossypifolia, L.—That is the species which is referred to by the late Dr. Ernst, of Caraccas, as the tua-tua of the West Indies. There is nothing in the description of the uses of the drug to identify it with his "Goleccion de Medicamentas Indigenas" (Caracas, 1898), which states any special efficacy in leprosy. He states that the leaves, made with a little salt, is used as a mild purgative for other disorders of the stomach, and in fevers. A decoction is said to be excellent for dropsy. The milky juice of the young shoots is applied to ulcers of the mouth. It is found in two forms—*staphysagriaefolia* and *elegans*. In British Guiana it is recorded from near Demerara. In the Niger district in West Africa. *Jatropha curcas*, a tropical species, has a good reputation in India as a remedy for leprosy, and *J. gossypifolia* may therefore be expected to be useful.—Pharm. Journ., Feb. 15, 1902, 121.

Castor Oil Press Cake—*Method of Rendering Food*.—Owing to the presence of a poisonous albuminoid in the oil cake, or castor pomace as it is called, is unfit for food. The albuminoid is soluble in a 10 per cent. col-

chloride in water, and is precipitated on boiling. Based on this fact, Oscar Nagel proposes a method of purification whereby the cake may be fitted for feeding purposes. The powdered castor pomace is mixed with six or seven times its weight of 10 per cent. salt solution, and allowed to stand for six or eight hours, during which time it is thoroughly stirred. The mass is filter-pressed and washed with more of the salt solution until all the albuminoid is removed, as shown by the absence of a precipitate on boiling a little of the solution in a test tube. The cakes are then removed from filter-press and dried. It is an interesting physiological fact that ricin, which has such a poisonous effect on man, is quite harmless to chickens.—Pharm. Journ., Mar. 15, 1902, 213; from Journ. Soc. Chem. Ind., 21, 30.

URTICACEÆ.

Cannabis Indica—*Rapid Deterioration*.—Frequent inquiries concerning the bad quality of Indian hemp in recent years have induced E. M. Holmes to address Dr. D. Train, Director of the Botanical Survey of India, with the object of ascertaining the cause. From the reply received, which is given in full in the present paper, it appears that Indian hemp, or “ganjah,” while in theory it is only of one quality, is found in the Indian market in many sorts, depending on the place where the drug is produced, the way in which the plant grows, and the age. It is particularly the latter that appears to affect the quality of the drug, although the preference is given to the Bengal over the Bombay article. Native buyers will not buy “ganjah” that is over a year old, if they can help it. English buyers are probably not so particular, and the older drug is supplied to them by the dealers. This readily explains the inferiority of the drug as found in the English market, for it is stated that the one-year-old drug is only one-fourth as strong as the fresh drug, and when it is two years old it is practically inert. The best time to import “ganjah” is in April or May, but even then everything depends on whether the agent is able to secure the fresh drug. Mr. Holmes, commenting on these remarks of Dr. Train, suggests that if it were possible to procure a tincture made in India from the fresh drug collected in Bengal it would in all probability furnish the most satisfactory preparation.—Pharm. Journ., April 26, 1902, 342.

Cannabis Indica—*Cause of Deterioration and Prevention*.—C. E. Marshall, referring to a paper read before the American Medical Association in June, 1898, observes that he had at that time pointed out that the brownish resinous constituent of Indian hemp, which has been named “cannabinol,” is undoubtedly the constituent to which the activity of the drug is due, but that this constituent is liable to lose its activity on exposure to the air, darkening so as to form a pitchy mass, almost completely devoid of activity. The obvious remedy seemed to be complete exclusion from the air, by keeping it, as well as preparations of Indian

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MONIMINACEÆ.

Boldo Leaves—Botanical Source and Distinction.—F. W. Neger points out that true boldo leaves are liable to be confounded with the leaves of another plant distributed in the same localities in Chili, possessing great similarity in their external characters and particularly in their odor, and known under similar botanical names. The true boldo was designated botanically as *Boldoa fragrans* by Gay, but this name had to give way to that previously given to it by Molina, *Veumus Boldus*. It so happens that the other plant, with which it possesses the similarities mentioned, a Lauracea, is known in Chili by the name of *teumo*, its botanical name being *Cryptocarya teumus*, Nees. In the present paper the author describes the botanical, macroscopical and microscopical characters of the two kinds of leaves, illustrated by cuts showing the microscopical structure of the two kinds of leaves in transverse sections. The true boldo has the reputation in Chili of being an efficient hepatic remedy and is frequently resorted to by the natives, and also by regular practitioners, in the treatment of liver affections. The pleasantly odorous volatile oil has also attracted attention to the leaves. It is doubtless obtainable in abundance and cheaply if demanded and may possibly prove an advantageous substitute for eucalyptus oil, pine-needle oil, etc., as an antiseptic perfume for rooms.—Pharm. Centralh., Aug. 1, 1901, 461-464.

MYRICEÆ.

Myrica Gale, L. and Myrica Cerifera, L.—Structure of the Stems.—In his thesis for the degree of Graduate in Pharmacy, 1901, A. G. Krembs, Jr., gives an admirable description of the microscopic features of the stems of *Myrica gale*, L., the only species of *myrica* indigenous to Europe, and of *myrica cerifera*, L., one of the six species known to be indigenous to North America, and popularly used in the eclectic practice of medicine under the name of bay-berry. The characteristic features of distinction of the two drugs are clearly depicted in 12 plate illustrations accompanying an abstract of the thesis in Pharm. Rev., July, 1901, 128-136.

CONIFERÆ.

Savin—Species of Juniperus Yielding the French Supply.—Perrot and Mongin have come to the conclusion that the savin which as supplied to French druggists is derived chiefly from the southwest of France, consists of a mixture in varying proportions of *Juniperus sabina* with *J. thurifera* var. *gallica*. They do not regard the admixture of the latter with true savin as serious because it appears to possess similar properties. The twigs resemble the genuine in the arrangement of the leaves, but differ in the fact that sclerenchymatous cells occur in the mesophyll. The fruit of *J. thurifera* var. *gallica* is larger than that of *J. sabina*. The twigs of *J. phænicea*, which have been substituted very commonly for true savin, have

the leaves spirally arranged so that the section never shows opposite leaves as sections of the two other species. The mesophyll of *J. phænicea* contains numerous sclerenchyma cells, which it can easily be distinguished from *J. sabina*.—*Ann. Pharm.*, 19, 1902, 313; from *Bull. des Scienc. Pharm.*, 4, 33.

Araucaria Rulei, E. V. Mueller—*Analysis of the Gum-Resin of Araucaria Rulei*.—Heckel describes the gum resin of *Araucaria Rulei* from New Caledonia, as occurring in three forms: (1) reddish, translucent pieces; (2) reddish, vermicularly twisted pieces, resinous and (3) semi-solid cakes. He has subjected the gum-resin to analysis, with results shown in the following table:

Araucaria Gum.	In pieces.	Semi-solid.
Resin	53.50 per cent.	43.80 per cent.
Gum	34.30 per cent.	42.50 per cent.
Water	5.70 per cent.	8.05 per cent.
Ash	2.00 per cent.	1.99 per cent.
Insoluble constituents.....	4.50 per cent.	3.66 per cent.

The taste of all is bitter and somewhat aromatic, resembling that of larch-turpentine, but devoid of the pleasant odor of the gum-resin of *Araucaria Bidwilli* and of *A. Cunninghamii*. In position they resemble the gum-resin of *A. Cookii*.—*Ann. Pharm.*, 1901, 563; from *Rep. de Pharm.*, 1901, No. 6.

American Colophony—Composition.—W. Fahrion states that American colophony consists chiefly of silvinic acid, $C_{20}H_{30}O_2$, of an amorphous modification, which, by treatment with water or by the action of gaseous HCl, is converted into a crystalline form which shows a higher melting point. This, by long heating, is transformed into the amorphous condition. Silvinic acid ages, and, consequently, the free acid and its salts undergo oxidation on exposure to the air, forming the oxides $C_{20}H_{28}O_4$, and $C_{20}H_{26}O_6$, insoluble in petroleum ether. Both are readily converted into silvinic acids, $C_{20}H_{30}(HO)O_3$ and $C_{20}H_{30}(OH)_2O_4$, which are soluble in petroleum solvent. Both these last-named acids occur, in various proportions, in commercial American resin. Oxidation, however, does not stop here, these oxysilvinic acids being capable of further oxidation. The silvinic acid takes up another atom of oxygen, forming a trioxysilvinic acid, insoluble in petroleum ether, while tetraoxysilvinic acid also becomes insoluble by losing water and forming another insoluble peroxysilvinic acid. This acid is oxidized with $KMnO_4$, in addition to these acids, by auto-oxidation, an acid which is probably tetraoxysilvinic, $C_{20}H_{30}(HO)_4O_2$, is formed. The author finds that t

attributed to abietinic acid by Mach, is incorrect.—Pharm. Journ., May 31, 1902, 449; from Chem. Centralblatt, 73, 120.

Larch Turpentine—Detection of Adulteration.—According to L. van Itallie, adulterations of larch turpentine, which are of frequent occurrence, are best detected by determination of the acid and saponification number of the sample. Good, unadulterated larch turpentine has an acid number of about 70 (66.08 to 72), and a saponification number of 113.5 to 119.4. Adulterated larch turpentine showed saponification numbers ranging from 108 to 109.3, and acid numbers from 97 to 99.5. In other cases, products are sold as larch turpentine that show no saponification number at all, and which consist simply of mixtures of resin and resin oil.—Pharm. Ztg., Mar. 5, 1902, 179; from Pharm. Weekbl., 109, No. 5.

Manila Copal—Proximate Constituents.—A. Tschirch and M. Koch have made an exhaustive investigation of two typical sorts of Manila copal, the so-called "soft (dull) alcohol-soluble" and the "hard (shining)" variety—these two sorts occurring in commerce under different designations in accordance with their color, purity, etc. Manila copal represents the commercial sorts of the copals of commerce, and is now conceded to be the product of

Dammara orientalis, a coniferous tree, and not, as has been assumed by most authorities, of *Vateria indica*, belonging to the Dipterocarpaceae. The results of the author's investigation are briefly as follows:

I. *Soft (dull) Alcohol-Soluble Manila Copal* was composed of 79 per cent. of acid resins soluble in soda solution, of which 4 per cent.—manocopalinic acid, $C_8H_{12}O_2$, and manocopalonic acid, $C_8H_{14}O_2$ —were dissolved by ammonium carbonate and 75 per cent. consisting of α - and β -manocopalolic acid ($C_{10}H_{18}O_2$), were soluble in sodium carbonate. The portion insoluble in soda solution consisted of 12 per cent. of resin, $C_{20}H_{32}O$, 6 per cent. of volatile oil, 2 per cent. of water, and 1 per cent. of impurities, including traces of a bitter substance. The volatile oil, when fresh, is colorless, mobile, has a pleasant odor, and is miscible in all proportions with absolute alcohol, ether, chloroform, etc., as well as with fixed oils. Its sp. gr. at 15° C. is 0.840, its boiling point between 165° and 170° C., and it is neutral in reaction when first obtained, but soon acquires a yellowish color, an acid reaction, and resinifies. The manocopalonic acid is crystalline.

Hard (Shining) Manila Copal yields 80 per cent. of resin acids to soda solution, which are composed exclusively of α - and β -manocopalolic acid. Of the remaining 20 per cent., 1 per cent. consisted of impurities (including bitter principle), 5 per cent. of volatile oil (evidently identical with that obtained from soft Manila copal), 12 per cent. of resin, and 2 per cent. of water.—Arch. d. Pharm., 240, No. 3 (April 15, 1902), 202–229.

Shellac—Detection of Adulterants.—An editorial note in the "Chemist and Druggist" (Oct. 19, 1901) calling attention to the not uncommon

published to be very unsatisfactory, and noteworthy particularly from their discordance. From his own experience, he finds the only determinations upon which reliance can be placed to be the iodine absorption, the free acid, and the ester numbers; and although further researches may result in a discovery of more accurate methods, these are the ones to be chiefly relied on for the determination of the quality of shellac. The typically pure samples examined by the author gave acid values of between 55 and 65; the acid value of typical samples of rosin varied from 150 to 170. The ester values are equally divergent in the two rosins. Pure shellac gives figures varying between 155 and 175, while the ester value of rosin seldom reaches 20—averaging about 10, a figure regularly obtained with commercial samples. Equally valuable is the distinction between the iodine absorption values of the two substances, a limit of 4 to 10 covering the genuine samples of shellac examined by the author; whereas rosin has a fairly constant iodine value of 105 to 120, averaging about 110. The extreme divergence in these figures permits of an approximate determination of the amount of rosin in samples of shellac, which can thus be well graded by their use.—*Chem. & Drug.*, Oct. 26, 1901, 689.

In a second paper, Mr. Parry states that he has examined a large number of samples of shellac, the majority of which were adulterated (with rosin), and a small number of them certainly pure. As a further result of his experience, he points out that the iodine absorption value is by far the most reliable of the methods for ascertaining the amount of common rosin present. Of the adulterated samples examined, many contained from 20 to 25 per cent. of rosin and some over 40 per cent.—*Ibid*, April 26, 1902, 670.

B. ANIMAL DRUGS.

Sponges—Where They Live, How Obtained, and Their Uses.—At the pharmaceutical meeting of the Philadelphia College of Pharmacy, in November, 1901, Albert Hart, who is evidently a practical sponge expert, communicated a paper on the habitat, collection, kinds and uses of sponges, which must prove interesting even to those who are well posted on subjects connected with the sponge industry. To those who find it difficult to realize that the sponge is an animal, his very lucid description of the nature and habits of the animal will prove convincing. It must be remembered that the sponge of commerce is, in reality, only the skeleton of a sponge—varying in composition in different kinds of sponges—and that in its natural state a sponge is a very different looking object, resembling somewhat the appearance of the jelly-fish, or mass of liver, the entire surface being covered with a thin, slimy skin, usually of a dark color, and perforated to correspond with the apertures of the canals, com-

monly called "holes of the sponge." These sponges are collected in two ways, by divers, as practiced by the sponge fishers in the Mediterranean, or from boats, after having been located by means of a water glass, with long poles provided with double hooks, as practiced in the Florida and West Indian waters. After collection, the sponges are laid out to decompose—"a process better observed at a distance, owing to the obnoxious odor." They are laid out in kraals on the beach, and so washed by the sea and finally cleaned. Of commercial sponges there are many different varieties, differing according to texture, character of fiber, etc., each variety again having different grades. From Florida and the West Indies we obtain the so-called sheepswool, velvet, yellow, grass, glove, reef, hard-head, and wire sponges; from the Mediterranean we obtain the "Turkish bath" or honeycomb sponges; "Turkey sponges," known as silk sponges; leather sponges, known as elephant ears or wash-rag sponges, etc. It is impracticable here to follow the author's description of the characters and qualities of these different sponges, but in view of the growing scarcity of sponges in general, and particularly of the better grades of the so-called sheepswool sponges, the author's classification of the latter according to grades in the order of their value may here be briefly given. The most valuable of these West Indian sponges, the

"*Rock Islands*" *sheepswool*, are of a strong fiber and best form, and are most valuable for carriage washing and heavy work; although, when bleached, they also make fine bath sponges, becoming, however, weaker by the bleaching process. Next to this the

"*Key*" *sheepswool* is a good form, has a soft, close fiber, but lacks strength owing to the iron contained in it, which is evidenced by the bright red color of the root and running entirely through the structure of the sponge. It is extensively bleached and looks nice, but wears badly, owing to the excessive use of acids necessary to abstract the iron.

"*Abaco*" *sheepswool* comes next. It resembles the Rock Island, though lacking its strength. The

"*Cuba*" *sheepswool* resembles the "Key" variety, but is lighter in color. Finally the

"*Nassau*" *sheepswool* is the coarsest grade and is irregular as regards the horny fibers, firmness and shape.

A practical point in connection with the purchase and sale of sheepswool sponges is that there is an increasing practice of dealers to offer them by the piece, instead of, as was formerly the case, by the pound. The latter, for reasons well understood, has proven unsatisfactory. It is not alone that sponges are purposely loaded with sand and moisture, but the sponges will absorb humidity in the summer time, while in the winter time, owing to dryness of the air, they lose in weight.—*Amer. Jour. Pharm.*, Dec., 1901, 584-591.

Sponges—Method of Fishing in the Levant.—The American Consul at Beirut, Mr. G. Bie Rayndal, has made an interesting report on the condition of the sponge-industry in the Levant, for the benefit of American sponge-merchants. The report deals chiefly with Greek and Turkish sponges, the output of which during the last fifteen years has greatly diminished, owing to the introduction by Greeks, in the seventies, of diving apparatus which proved ruinous to fishermen and fisheries alike. In collecting the sponges, four methods are employed, viz., harpooning, primitive diving, dredging and diving with special outfit. The most popular method in the Levant is diving with no other apparatus than a slab of stone as a sinker, and a cord to communicate with the surface. On reaching the bottom, the diver hastily snatches up as many good sponges as possible, and, after remaining under water from one to two minutes, tugs violently at the cord, and is drawn to the surface. The sponges are collected in a net which the diver carries round his neck. At greater depths, particularly along the coasts of Asia Minor, dredging is employed, usually in winter, when storms have torn up the seaweed which covers the bottom. With the harpooning method, one of the chief difficulties is to see the bottom clearly through a troubled sea. To obviate this, a wood or zinc-plate cone, like a water bucket, open at the top and with a glass bottom, is used. On looking through this water-glass, which is partly submerged, the bottom of the sea may be clearly studied even at thirty fathoms, and the proper sponges picked up by the harpoonist. To these simple operations was added, some twenty-five years ago, the "skafander," or diving-apparatus, which enables the diver in his submarine dress to spend an hour under water at a depth of ten to fifteen fathoms. Experience has shown that this method is a severe tax upon the sponge-banks, as everything in sight—sponges large and small—is gathered. The fishermen who use the skafander are frequently stricken with palsy of the lower extremities and other complaints.—Chem. and Drugg., April 12, 1902, 570.

Sponges—Home-made Stand.—"H. M. W." suggests a home-made stand for the display of sponges, which is shown by Fig. 49, and is easily made by any one who can handle a hammer. The cost is very small. It is built on two 2x4 joists cut 18 inches long. Four shelves, each measuring 18x24 inches, are cut from 1-inch lumber, a 1x2 inch notch being cut in each corner. Also cut four 48-inch lengths from 1x2 inch strips. Now place the joists on their 2-inch sides, 20 inches apart, and put on them one of the shelf boards, nailing it to the joists. Erect in the notches in the corners the 1x2 strips, and fasten them securely. The other shelves are to be nailed to these strips. The distances between shelves, as shown in the illustration, are 13, 14½ and 16½ inches in the clear. When the shelves are in position the next work is to cover the two 18-inch sides, and one of the 24-inch sides with wire netting. This is to be tacked on. Should it be desired to cover the tacks, this can be done

with half-round molding. The other 24-inch side should have inch half round nailed at little intervals to the lower half of each opening, so as to keep the sponges from falling out on the floor. Castors should be placed

FIG. 49.

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Home made Stand.

on the bottom of the joists, so that it can be easily moved around the store.—Amer. Drugg., Sept. 23, 1901, 170.

Cantharides—Excessive Requirement of the Ph. Germ. IV.—According to the Ph. Germ. IV, cantharides, when treated by Baudin's method, should yield 0.8 per cent. of cantharidin. K. Dieterich considers this requirement too high, and finds that the average yield of commercial Spanish flies is nearer 0.6 per cent. He also finds that *Mylabris cichorii* is richer in cantharidin, and that the active principle is extracted from it less contaminated with impurities than from cantharides. He therefore advocates the inclusion of "Chinese flies" as a source of the vesicant. The following results were obtained from the examination of commercial specimens. *Cantharides*: Ash, of whole beetles, 5.05 to 6.02 per cent.; of the powdered beetles, 5.23 to 7.47 per cent. Free cantharidin, 0.28 to 0.56

per cent. ; combined cantharidin, 0.03 to 0.30 per cent. ; total cantharidin, 0.38 to 0.85 per cent. Moisture, in whole beetles, 10.06 to 15.94 per cent. ; in powdered beetles, 7.06 to 15.05 per cent. *Mylabris cichori*: Ash of whole beetles, 3.98 to 5.01 per cent. ; of powdered beetles, 4.16 to 5.10 per cent. Free cantharidin, 0.67 to 1.01 per cent. ; combined cantharidin, 0.135 to 0.95 per cent. ; total cantharidin, 0.73 to 1.92 per cent. Moisture in whole beetles, 10.42 to 12.54 per cent. ; in powdered beetles, 7.53 to 11.64 per cent. Since cantharidin begins to sublime at 100° C., care must be exercised in the drying process or loss will result from volatilization. Copper was detected as a constituent of the ash of cantharides.—Pharm. Centralhl., Oct. 24, 1901, 674.

Cochineal—Value in Whooping Cough.—Hesse has used cochineal with good effects in cases of whooping cough. He gives teaspoonful doses every two or three hours of the following mixture : Cochineal, 1 or 2 Gm. ; potass. carb., 2 or 3 Gm. ; sugar, 10 Gm. ; water, 100 Gm.—Amer. Drugg., Sept. 23, 1901, 170 ; from Klin-ther. Wchschr., 1901, 139.

Insects in Vegetable Powders—Removal.—J. Wetnig calls attention to the following method of destroying and removing insects from vegetable powders that have become infested with them : The powder having been transferred to a bowl or mortar, it is thoroughly moistened with petroleum ether (or benzin) and allowed to stand, under frequent stirring, exposed to the air during several days until the odor of benzin is completely removed. It is then sifted through a fine sieve to remove the dead insects. The container, if of wood, should be washed with benzin and dried before returning the powder.—Pharm. Ztg., Aug. 21, 1901, 665.

In a subsequent note the author explains that the method recommended by him is not intended for medicinal powders, except possibly such as are employed externally and in veterinary practice, but is useful for certain expensive vegetable powders that are employed for technical purposes.—*Ibid.*, Sept. 4, 1901, 706.

Yellow Wax—Unsatisfactory Commercial Quality.—Robert C. Pursel and Willard R. Graham call attention to the abnormal characters of a large proportion of the samples of yellow wax examined by them, as is revealed by a glance at the following table of constants prepared by them :

No.	Sp. Gr. at 15° C.	Melting Point.	Acid Value.	Saponi- fication Value.	Ester Value.	Adulterant.
1	0.9437	62° C.	13.74	59.48	45.74	Paraffin.
2	0.9120	61° C.	10.77	55.78	46.01	Paraffin.
3	0.9340	65° C.	6.36	30.72	24.36	Paraffin.
4	0.9548	63.5° C.	19.16	99.92	80.76	
5	0.9560	63.5° C.	19.11	95.53	76.42	
6	0.9483	64° C.	27.14	102.36	75.22	Stearic acid, paraffin.
7	0.9463	63° C.	24.31	95.00	70.69	Stearic acid, paraffin.
8	0.9540	64° C.	19.50	93.33	73.80	
9	0.9520	52° C.	14.62	70.86	56.24	Paraffin, tallow, yellow ochre.
10	0.9515	63.5° C.	24.20	97.12	79.92	Stearic acid.

When paraffin is used as adulterant the acid value is naturally reduced : the latter is then brought up by the addition of stearin ; usually in this case, too much is added, which makes the acid value abnormally high.—Amer. Journ. Pharm., Nov., 1901, 556.

Beeswax—Examination of More or Less Adulterated Samples.—Lyman F. Kebler reports the following results of an examination of commercial samples of beeswax :

Kind.	Melting Point.	Specific Gravity.	Acid No.	Ether No.
White.....	64° C.	0.926 at 15° C.	6.2	66.6
Yellow	64° C.	0.938 at 15° C.	12.9	60.9
Yellow	55° C.	0.9138 at 15° C.	10.9	22.6

Evidently these samples were liberally adulterated with ceresin, while the ratio existing between the acid numbers and ether numbers show that tallow or some similar substance was also added—such addition bringing up the ether—but not the acid number.—Amer. Journ. Pharm., March, 1902, 142.

Beeswax—Determination of Rosin as Adulterant.—It is well known that common resin is sometimes added to beeswax in order to counteract the effect of some other adulterant on the analytical figures, the resulting mixture having nearly all the usual constants for true beeswax. Ferdinand Jean gives the following as an accurate method for determining the amount of rosin in such samples : One gramme of the wax is treated with 80 per cent. alcohol on the water-bath ; when the wax is melted the mixture is well shaken, and after a time allowed to cool quietly. It is then filtered through balanced filter-papers. The insoluble portion is washed with cold alcohol until the washings are free from acidity, when the rosin and stearic acid will be found in the filtrate, the beeswax and most other bodies being on the filter. The weight of the insoluble portion is taken, and the greater portion of the alcohol is driven off from the filtrate. The residue is taken up with ether, and the ethereal solution shaken with zinc oxide. When

the solution is no longer acid the mixed stearate is collected on a filter, washed with ether, and the ethyl resinate is decomposed with water and hydrochloric acid; it can then be taken up with petroleum ether and dried. *Chem. and Drugg.*, Feb. 22, 1902, 304; from *Ann. C.*

Honey—Adulteration with Sucrose.—Lyman F. Farnham examined a sample of honey with the following results: specific gravity, 1.354; reaction, acid; pollen grains, none; moisture, 16.021 per cent.; optical rotation, direct, + 9.5 divisions at 25° C., optical rotation, after inversion, — 11.6 divisions on scale, at 25° C.; reducing sugar, direct, 54 per cent., after inversion, 63.5 per cent. These figures all indicate the addition of cane sugar.—*Amer. Journ. Pharm.*, March, 1902, 109.

Honey—Albumen a Characteristic Constituent of Natural Honey.—W. Braeutigam has observed that natural honey in solution gives a reaction for albumen, while artificial honey is invariably free from albumen. He proposes a method for the determination of the source of honey based on the reaction and tests for the identification of albumen. *Ztg.*, Feb. 8, 1902, 109.

Honey—Fallacy of the Pharm. Germ. IV. Tests.—Attention is called to certain unsatisfactory definitions and tests in the Pharm. Germ. IV. for the purpose of establishing the purity of natural honey. Thus, the description of color—light yellow to white while applicable to natural honey collected by bees from heather, and buckwheat blossoms, excludes the honey from buckthorn, hedge-mustard, and many other flowers, which give colors from lemon yellow to greenish brown, brown, and sienna. Then the requirement that a solution of honey in two parts of water not have a sp. gr. below 1.11 necessarily excludes many natural honeys, recently drawn young honey frequently showing a sp. gr. from 1.072 to 1.095 under the conditions of the test. The alcohol test, according to which the solution of honey in five parts of alcohol should show only faint opalescence when mixed with five parts of water, is to be misleading, and does not exclude artificial honey of the very sorts that show the least opalescence at the test, it is true, would lead to the discovery of artificial honey adulterated with starch syrup or crude molasses; but this is not practiced to any considerable extent now. The detection of cane sugar by the inversion of cane sugar with mineral acids, the silver nitrate and barium nitrate tests, has also been found to be unreliable, as the modern methods of manufacture; for these acids are present in the inverted sugar solution, and, moreover, have been placed in the industrial production of invert sugars.

The author concludes that an exact and reliable method for distinguishing between natural and artificial honey remains to be established. For the present, reliance cannot be implicitly placed upon the official characterization and tests, the most reliable aid to the determination being the odor and taste of the sample offered.—*Pharm. Ztg.*, March 22, 1902, 227.

Purified Honey—Method Adapted to the White American Sorts.—H. Kühl observes that the honey now most frequently supplied for preparing purified honey is that known in German commerce as “*Mel albissimum americanum*.” This, on examination, proved to be a purely natural product, but was very rich in proteine substances, which interfered with the customary methods of purification, yielding a more or less opalescent product. The author finally resorted to the old and well known method, now seldom used, which consists in adding 10 per cent. of clay, previously rubbed to a paste, to the hot solution of the honey (1 : 3), heating the mixture to boiling, filtering, and evaporating on a water-bath to the official density ($=1.33$). The product so obtained is perfectly clear and bright, and keeps well. The clay not alone removes the proteine and albuminoid substances, but also other impurities that may exist in the crude honey.—*Ibid.*, 228.

Cod Liver Oil—Possible Fallacy of the Nitric Acid Test of the Germ. *Pharm. IV.*—Bedall calls attention to the observations made by him that a sample of pure and genuine codliver oil, which had been kept about one year, failed to give the rose color described by the *Germ. Pharm. IV.* when the oil is shaken with fuming nitric acid, whereas the reaction was readily obtained with a fresh specimen of genuine codliver oil. The reaction is best observed on a watch glass.—*Pharm. Centralh.*, Feb. 27, 1902, 118.

Chamois Skins—Preparation and Commercial Varieties.—Charles C. Drueding interestingly describes the method of preparation of the so-called chamois skin of the market, of which there is a good variety. Special inquiry made during a recent visit to Switzerland, reveals the fact that the total annual crop of genuine chamois skins is between five and six thousand, a quantity which would not supply the United States for more than a single day if the skins sold as chamois skins were the skins of the animal of that name. As is well known, the chamois skin of the market is really an oil-tanned sheep or lamb skin lining, the lining or fleshier being the inner portion of the skin obtained by splitting the skin in two by the aid of delicately adjusted machinery, while the outer portion, known as grain or skiver, is unsuitable for making chamois skins, and is used for other purposes, such as hat linings, book covers, etc. In so far as reliability is concerned, the true chamois skin is heavier and coarser, is also stronger and more durable; but for ordinary use and appearance the oil-tanned sheep-skin lining would, in most instances, be preferred. The author explains

barium chloride indicates their presence, a definite quantity of the standard sulphate solution is made up to 10 Cc. and the same reagents added. A few trials are sufficient to obtain a precipitate of as nearly as possible the same depth as that in the first case. The strength and the quantity of the sulphate solution being known, the approximate quantity of impurity present in the salt is easily calculated. It is convenient to make the standard solutions of such a strength that each cubic centimeter represents a certain percentage or decimal fractional percentage of impurity in the substance. In the case of SO_4 " each Cc. might contain one centigramme or milligramme of SO_4 ". Suppose 1 Cc. = 1 Cgm. SO_4 ". Then if 1 Cc. of this solution, made up to 10 Cc. with distilled water, when treated with suitable reagents, gave the same depth of turbidity as the 10 Cc. of solution containing 0.5 Gm. of the substance to be tested, when similarly treated the approximate percentage of impurity is easily calculated. Thus 0.5 Gm. substance = 1 Cc. SO_4 " solution = 0.01 Gm. of SO_4 " as impurity.

Hence 100 Gm. substance contain $\frac{0.01 \times 100}{0.5} = 2$ Gm. of SO_4 ". The substance therefore contains 2 per cent. of SO_4 ".—Pharm. Journ., Feb. 22, 1902, 143.

Metals—Cellular Structure.—G. Cartand has made some interesting experiments concerning the cellular structure of metals. If molten lead, tin, zinc, cadmium or bismuth are poured upon glass plates, so that a thin layer of the metal shall congeal upon them, the surface of the metal will not be smooth. When viewed under a lens of 200 diameters, the surface of bismuth appears distinctly crystalline, while that of the other metals named presents a network of cells. The cellular structure appears to be normal for the amorphous metals, while in the case of crystalline metals the cellular structure seems to be combined, and even completely obscured by the crystallinity.—Pharm. Ztg., Nov. 20, 1901, 926; from Chem. Centralbl.

Ancient Alloys—Composition.—Berthelot has obtained some interesting results which throw much light on the knowledge of metallurgy of the ancients. A Chaldean statuette about 2,600 years old was found to consist solely of an alloy of four parts of copper and one part of lead, with a little sulphur. This shows a totally different composition from that of statuettes of later date, about 2,200 years old, which consists of practically pure copper, containing no lead, and only a trace of iron. A Babylonian statuette of unknown antiquity consisted of an alloy of copper, 79.5; tin, 1.25, and iron, 0.8 parts. The pedestal of a Babylonian bull was found to consist of copper, 82.4, tin, 11.9, and iron, 4.1 parts. An object of white metal of Hittite origin proved to be silver. A substance derived from the tomb of Abou Roash of the fourth dynasty, and supposed to contain silver, consisted of a mixture of argillaceous matter mixed with lead chloride, was free from silver, and was doubtless derived from a leaden object which had

Mineral Acids—Action on Glass Containers.—T. and C. T. Tyrer record the results of some experiments made to test the accuracy of the statements that have been made at various times, that mineral acids have become impure through their action on glass containers. The experiments were made with sulphuric acid (sp. gr. 1.843), hydrochloric acid (sp. gr. 1.100), nitric acid (sp. gr. 1.420), and hydrobromic acid (sp. gr. 1.077), all of them pure and giving inappreciable residues. The containers were of green, white, amber, and blue glass, such as are usually sold, and the acids allowed to remain in contact for seven months in diffused light. None of them showed appreciable or increased residue, and there was no evidence whatever that they had suffered any deterioration.—Trans. Brit. Pharm. Conf., 1901, 407-408.

OXYGEN.

Oxygen—A New and Convenient Source.—Jaubert has introduced compressed blocks of sodium peroxide, or of the peroxide of potassium-sodium alloy, which previous to compression is mixed with the theoretical quantity of a permanganate or hypochlorite, or a trace of a salt of nickel or copper, in order to decompose the hydrate of sodium peroxide, which is stable in the cold. By this means a material is obtained which, on merely coming in contact with cold water, evolves large volumes of chemically pure oxygen. It is claimed that by this means the transport of oxygen has become safer and more convenient, while its industrial application is facilitated by the ease with which the gas may be generated.—Pharm. Journ., June 27, 1902, 550; from Compt. rend, 134, 778.

Liquid Oxygen—Technical Production.—The manifold application of oxygen in industrial operations as well as in the practice of medicine has created a demand for this element in a pure condition, convenient form and moderate cost. The available methods for this purpose, which are reviewed in "Pharm. Zeitung," July 20, 1901, consist of three—that of Brin, the electrolytic and that of Kassner—to which possibly a fourth method may be added in the near future, depending on the fractional distillation of liquid air. The latter is at present the object of experiment by Prof. Raoul Pictet with reasonable prospect of success. Of the three methods that of Brin, which is also the oldest, is the one most successfully employed. It is based upon the peculiar property of barium oxide to absorb oxygen from the air when heated to a certain temperature with formation of barium peroxide, and the facility with which the peroxide parts with the absorbed oxygen again when heated to a higher temperature. The oxygen so produced contains only insignificant quantities of nitrogen; it is practically chemically pure, and is compressed in steel cylinders by methods which are now well understood. The residual barium oxide is

cooled down by passing a fresh supply of atmospheric air through it ; when sufficiently cooled it again absorbs oxygen, becomes reconverted into peroxide, and the process is then carried on continuously. The electrolytic method is carried out in various ways, and depends in all cases on the electrolysis of weak alkalies by means of iron electrodes. But the oxygen obtained by this method is contaminated with considerable quantities of hydrogen and is always malodorous. The third method, that of Kassner, depends on the formation of lead peroxide when atmospheric air is passed over calcium plumbate at certain temperatures, expelling the nitrogen by means of steam, and then decomposing the peroxide by passing carbon dioxide over it. The disadvantages of the process are that it is complicated and that very high temperatures are required ; the reaction beginning at 500° , reaching its maximum at 750° and ending at 800° C., which necessitates that the air, steam and carbon dioxide must be heated to over 1000° C. in order that the required temperature of the reaction may be attained. A further disadvantage consists in the difficulty of separating the outflowing current of steam from the inflowing current of carbon dioxide. The fourth method, that now under experiment by Pictet, is based upon the observation that when liquid air is distilled at a temperature of -194.5° C. under ordinary atmospheric pressure, the nitrogen distills off with practical completeness, and if the temperature is then raised to -183° C., the oxygen distills over in a nearly pure condition. The distillation is effected by pouring liquid air on water, having the ordinary temperature, contained in a large glass vessel. At first, the nitrogen is given off in copious vapor, which gradually diminishes, ceases, and then, when the temperature has risen sufficiently, recommences with violent evolution of oxygen vapor. The principal technical uses of liquid oxygen are in the production of steel, for repairing defects in large iron castings, and for the production of the oxyhydrogen flame and calcium lights. Its therapeutic uses also have been extended in numerous ways since it has become possible to supply the pure gas economically.

Ozone—Bactericidal Action.—According to the studies and observations of A. Ransome and A. G. R. Foulerton dry ozone has little or no bactericidal action, and does not diminish the virulence of tubercle bacilli in sputum nor of the *B. mallei* and *B. anthracis*. They conclude that in nature ozone is not capable of any injurious action upon the bacteria. Any purifying action which ozone may exert in nature is due to the direct chemical oxidation of putrescible organic matter. Bacteria in water or milk are, however, to a large extent destroyed by the passage of a stream of ozone.—Pharm. Journ., Aug. 31, 1901, 293 ; from Proc. Roy. Soc., 68, 55.

HYDROGEN.

Hydrogen.—Production by the Action of Nitric Acid on Metals.—A. J. Ewart points out, as the result of his observations, and in striking contrast

to the common statement in text-books that hydrogen in certain circumstances be obtained by the action of nitric acid on magnesium under certain conditions of temperature and dilution of the acid, and that hydrogen thus be produced. If magnesium be added to cold dilute nitric acid ($\frac{1}{6}$ – $\frac{1}{8}$), an active evolution of nearly pure hydrogen takes place, although as the solution becomes warm and the percentage of nitric acid increases, the production of hydrogen rapidly diminishes. Journ., Feb. 1, 1902, 82; from Nature, 65, 128.

Solid Hydrogen—Preparation.—In a lecture delivered at the "Royal Institution," Prof. Dewar gave an explicit description of the process by which he demonstrated the preparation of solid hydrogen. This is published, properly illustrated, in Ch. News., Dec. 13 and 20, 1902, and 293.

Drinking Water—Filtration of the Common Supply.—In this paper, the author discusses the need of water purification and the methods of accomplishing this purpose on the extensive scale of the supply requirements of a city. In the present paper the author describes the use of a sand filter, referring particularly to the experience in Philadelphia, and the difficulties encountered in the operation of such a filter on the extensive scale required. A portion of the paper also deals with the consideration of the bacteriological investigations in connection with water purification, the paper concluding with a list of the processes which have been found most satisfactory at the Testing Station, Philadelphia. Jour. Pharm., Feb., 1902, 67–74.

Solution of Hydrogen Dioxide—B. P. Method of Assay.—In a paper by W. L. R. and C. S. Dyer have made some experiments with the view of determining the cause of the alleged unreliability of the B. P. method of assaying for hydrogen dioxide in the available oxygen in "Liquor hydrogenii dioxidi." This question has already been discussed in an exhaustive manner in the report of E. Smith (see Proceedings, 1898, 900), who records a series of estimations by most of the usual processes, except by the method of Mason, and, with this exception, practically all the other methods. Smith concluded that the most accurate method was that of Kingzett (which consists in adding sulphuric acid and potassium dichromate to the solution of hydrogen dioxide, and titrating the liberated iodine by sodium thiosulphate), that all gasometric methods are unreliable, and that the permanganate (the B. P.) method is entirely useless. The authors agree that the permanganate method is unreliable because under the conditions of the test the sulphuric acid in the brine in the nitrometer naturally liberates a little hydrogen, and this, in the presence of potassium permanganate, becomes chlorine, which is then decomposed into chlorine. It is the uncertainty as to the amount of chlorine which the chlorine is absorbed by the water, which renders the

the method doubtful. As a matter of fact, the authors have found the results by the permanganate method to be uniformly too high, whether the gas be collected over mercury, over saturated solution of magnesium sulphate, or over brine (saturated solution of sodium chloride), and in the latter case to be considerably higher when collected over the two first mentioned media; while when the B. P. volumetric solution of potassium bichromate is used, *without acid*, closely concordant results are obtained, whether the medium employed in the nitrometer is mercury, sat. sol. MgSO_4 , or brine. In the table appended to the author's paper the following figures are given: By the permanganate method (B. P.) collected over mercury, 8.4 to 8.5; collected over saturated MgSO_4 , 8.2 to 8.5; collected over brine, 10.30 to 10.35 volumes. By the bichromate method (Mason's), in the same order: 7.25 to 7.65; 7.4 to 7.7; and 7.6 to 7.7 volumes. In the latter process the evolution of gas is much slower than when the permanganate method is employed, but the oxygen obtained represents the volume of oxygen available in the sample.—Trans. Brit. Pharm. Conf., 1901, 339–344.

Hydrogen Dioxide—Acid Reaction.—According to the researches of A. Marcuse and R. Wolfenstein, pure hydrogen dioxide has an acid reaction. This has been demonstrated by them by decomposing the H_2O_2 in a sample of 30 per cent. solution, which possessed an acid reaction, by treatment with spongy platinum the neutrality of which was assured; the residual fluid possessed a neutral reaction.—Pharm. Ztg., Nov. 20, 1901, 925; from Ber. d. D. Ch. Ges., 34, 2430.

Hydrogen Dioxide—Preservation with Boric Acid.—As is well known, solutions of hydrogen dioxide usually contain either sulphuric or hydrochloric acid as a preservative. L. Delaie observes that under circumstances the presence of either of these acids may be objectionable, and proposes to replace them by boric acid, the presence of which, while a perfect preservative, does not in the least reduce or interfere with its therapeutic application. For this purpose the commercial hydrogen dioxide is neutralized with soda, using phenolphthalein as indicator, and 3 per cent. (possibly 1 or 2 per cent. will suffice) of boric acid is then dissolved in it by simple shaking.—Pharm. Ztg., Jan. 8, 1901, 25; from L'Union Pharm., 1901, No. 12.

Hydrogen Peroxide—Alleged Commercial Addition of Oxalic Acid.—G. Orth, having his attention called to the alleged addition of oxalic acid to commercial hydrogen peroxide, the addition being made for the purpose of fictitiously raising the decolorizing power of the product when titrated with permanganate, has investigated the subject and finds: (1) That the precipitate obtained on adding ammonia and calcium chloride is not, as has been assumed, calcium oxalate, but consists of hydrated calcium binoxide, resulting as a product of the reaction; and (2), that oxalic acid,

NITRITES.

if added to hydrogen peroxide, is decomposed so completely disappears in the course of a few weeks. More peroxide could not be transported in corked vessels on account of the gaseous products of decomposition.—*Chem. Zeit.* 1902, 183; from *Monit. Scient.* (4) xv, No. 715.

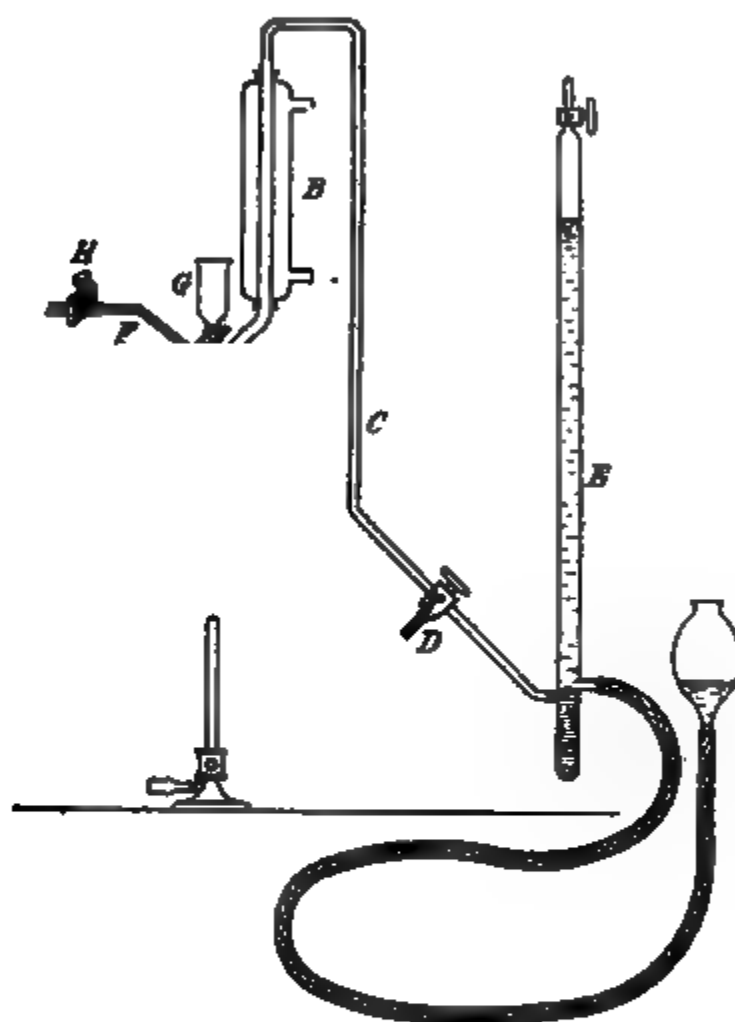
NITROGEN.

Nitrites—Precautions in Titration with Permanganate.—Smith has made experiments to determine how best to proceed with potassium permanganate, with the result that the following was adopted: Run in nearly all the permanganate (determined by a preliminary experiment), then acidify and continue the titration of permanganate until the pink color remains five minutes. The following are the experiments referred to: In the first titration to be settled was the order of mixing the solutions. When potassium permanganate was run into 10 Cc. of the sodium nitrite solution acidulated with sulphuric acid; 27.1 Cc. were required. When the approximate quantity of permanganate was run in, the solution was then acidulated and the titration quickly finished with permanganate. In the second titration 27.4 Cc. of permanganate were required. The opposite order was next tried, the permanganate being acidulated and then the nitrite solution until colorless. Two duplicate experiments required 11.15 Cc. of nitrite solution for 30 Cc. of permanganate, equivalent to 26.9 Cc. permanganate per 10 Cc. of nitrite solution as in previous experiments. Hence it appears that, provided the solutions are mixed before acidulating it does not make much difference whether the permanganate is added to the nitrite solution or the reverse order of mixing is adopted. Comparative titration with another sodium nitrite solution showed that it is not well to acidify the nitrite before running in the permanganate, because, as the decomposition results in a loss of gas before the permanganate is run in.—*Pharm. Journ.*, Feb. 22, 1902, 142.

Nitrites—Convenient and Expeditious Method of Determining Nitrites in Urine.—P. Gerlinger recommends a method for the determination of nitrites in urine, for which he makes the claim of simplicity, convenience, and celerity, the operation requiring not more than a few minutes. The method depends on that of Gailhat, which is based on the fact that when the solution of a metallic nitrite is added to a solution of one of a neutral ammonium salt and the mixture heated, a regular evolution of nitrogen results. For this purpose the apparatus illustrated by Fig. 50, the process being as follows: The Erlenmeyer flask, *A*, containing a saturated, boiled solution of ammonium chloride, is connected with the flask, *E*, by means of the reflux-condenser, *B* (about 15 C

glass tube, *C*, which is provided at *D* with a two-way stop-cock, which permits the exit of the gas either into the air or into the gasometer as may be required. The air is then expelled from the apparatus by admitting carbon dioxide through the stop-cock, *H*, and tube, *F*, which at this stage is raised so that the lower orifice is above the surface of the solution, heat being applied at the same time. When the expulsion of air is complete, the stop-cocks, *D* and *H*, are closed, the heating being discontinued, and the nitrite solution (the urine) is allowed to flow in slowly from the drop-funnel, *G*, which has been filled with water from the beginning of the

FIG. 50.



Apparatus for Determining Nitrites in Urine.

operation, this operation being facilitated by the occasional admission of a little carbon dioxide. The funnel is finally rinsed with a little distilled water dropped through it into the flask, and the contents of the flask heated to boiling, whereupon a mixture of carbon dioxide and nitrogen passes into the nitrometer, filled with solution of potassium hydroxide, in which the carbon dioxide is absorbed, and the nitrogen accumulates. When the evolution of gas ceases, the last portions of nitrogen are driven into the nitrometer by admitting carbon dioxide from *H*, and, if the nitrometer has been protected from the heat of the gas flame, the volume of nitrogen may be read off without appreciable error, a correction being

made in the reading, most conveniently by the aid of Lunge existing variation from 0° C. and a pressure of 760 Mm. nitrite is then readily calculated from the ascertained volume. The presence of urea in the urine, or of the carbon dioxide, the result.—Pharm. Ztg., Mar. 8, 1902, 188; from Ztschr. Chem., 1901, No. 50.

Nitric Acid—Production of Hydrogen by its Action on under “Hydrogen.”

Nitric Acid—Brucine Reaction.—G. Lunge contradicts the statement of L. W. Winkler that nitrous acid produces the same nitric acid with a solution of brucine in sulphuric acid, and this reaction occurs with nitrous acid or nitrites it is due to the oxidation of nitrous into nitric acid during the manipulation. It does not occur if the nitrous acid as soon as liberated is not converted into the stable nitrosyl-sulphuric acid. To avoid the eventual error the substance to be tested must be added to brucine dissolved in tolerably concentrated sulphuric acid, and thus prevent preliminary dilution with water. f. angew. Chem., 1902, No. 1.

H. Noll adds to the methods of applying the brucine test for nitric acid the following: A solution of 0.05 Gm. of brucine in concentrated sulphuric acid, sp. gr. 1.840, is added to 10 Cc. of the suspension and allowed to react, under stirring, during $\frac{1}{4}$ minute, when the color is compared in a Hehner's cylinder containing 70 Cc. of (distilled water). The color reaction is then compared with that produced under the same conditions with an aqueous solution of a nitrate of known strength. Pharm. Ztg., Feb. 3, 1902, 99; from Ztschr. f. angew. Chem., 1901, No. 53.

Nitrates—Improvement of the “Brucine-Test” for their Detection.—Cazeneuve and H. Défournel suggest the substitution of glacial acetic acid for sulphuric acid in applying the “brucine-test” for nitrates. To avoid the difficulty of obtaining a reagent which, in the absence of the substance tested, is absolutely without color reaction. In applying the test to

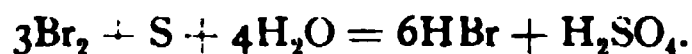
Nitrates in Waters, a liter should be evaporated to dryness in a water-bath manner, the residue taken up in 20 Cc. of water, and evaporated in a bottomed capsule with a little brucine. A few drops of glacial acetic acid are then dropped on while the capsule is still warm. The development of the test is 1 : 100,000. A yellow tint is obtained which turns to brown in twelve hours, or, on the addition of hydrogen peroxide, in half an hour. The test may be applied quantitatively by the method.—Pharm. Journ., Aug. 31, 1901, 293; from Bull. Soc. Chim. Paris, 1901, 25, 639.

HALOGENS.

Chlorine—Detection and Estimation in Presence of Iodine and Bromine.
—Otto Schmatolla proposes the following simple method for the detection of chlorine in iodides and bromides, which is dependent on the fact that strong oxidizing agents liberate iodine and bromine readily from iodides and bromides, but not chlorine from chlorides. The most suitable oxidizing agent for this purpose is nitric acid liberated in “statu nascendi” from potassium nitrate by sulphuric acid. In the practical process, however, it is necessary to employ a very large excess of potassium nitrate—at least 100 parts to 1 of the halogen salt—so as to reduce the direct action of the sulphuric acid upon the halogen salt to a minimum; otherwise, a loss of chlorine will be occasioned, since the sulphuric acid unavoidably liberates a portion of the chlorine. Under the conditions of the proposed test this quantity is however insignificant, and may safely be disregarded. The test is carried out as follows: Heat 0.05 Gm. of the halogen salt—for example sodium iodide—with 5.0 Gm. of pure potassium nitrate to boiling with 3 Gm. of water, and carefully add concentrated sulphuric acid, drop by drop, and water to replace that evaporated, until the addition of the last drop fails to develop iodine or to produce a yellow color. If the colorless solution is then diluted to 200 Cc. with water, the addition of a drop of silver nitrate solution should not produce more than a scarcely perceptible turbidity. Under observation of the foregoing conditions the method may be made quantitatively available.—Pharm. Ztg., Aug. 14, 1901, 645.

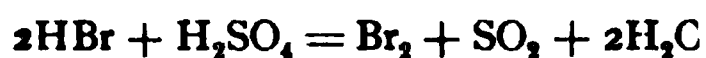
Potassium Chlorate—Toxity Possibly due to the Presence of Perchlorate.
—Referring to a recent fatal case of poisoning by potassium chlorate, taken by mistake for magnesium sulphate, Melckebeke calls attention to the fact that potassium chlorate is frequently prescribed in large doses with impunity, and suggests that the poisoning in the case mentioned was due to the presence of *perchlorate* in the potassium chlorate.—Pharm. Centralh., July 4, 1901, 411; from Chem. Ztg. Rep., 1901, 151.

Hydrobromic Acid—Convenient and Expeditious Process of Preparation.
—E. M. Marshall has made a series of experiments from which he deduces the following method for conveniently and expeditiously preparing hydrobromic acid. The method depends on the easy solubility of bromine in hydrobromic acid, the conversion of the bromine into sulphur bromide by the addition of sulphur, and the ready decomposition of the sulphur bromide when shaken with water, according to the equation:



A small quantity of hydrobromic acid is poured into a suitable vessel and bromine added, preferably from a separating funnel delivering below the surface of the liquid. The bromine dissolves, it being very soluble in this

acid. The liquid is stirred or otherwise agitated, and of sublimed sulphur added; combination at once the liquid becomes clear. More bromine is now added, continued, sulphur being added when the liquid shows bromine. The action goes on rapidly until the liquid is about 1.61, when an equilibrium is maintained between hydrobromic acids, the process tending to work back to free bromine and SO_2 .—



The liquid is now distilled in the usual way, but not sufficient to free the hydrobromic acid from traces; a second distillation renders it pure, colorless, and capable of forming a 10 per cent. solution, which on dilution 1 to 3 forms the test solution. Care should be taken that no sulphur bromide enters the receiver, otherwise free sulphur will distil and contaminate the product with sulphurous and sulphuric acids. A small amount of sulphur is added back in the generating vessel, and the original operation is repeated. Experiments prove that one ounce of sulphur is capable of converting 17 ozs. of bromine into hydrobromic acid. Reckoning on 100 per cent., it constitutes a little over 90 per cent. of the product formed, about 9 per cent. being sulphuric acid, from which it is separated by distillation.—Trans. Brit. Pharm. Conf., 1891.

Strontium Bromide—Commercial Forms.—K. J. L. examined the properties of strontium bromide, which occurs in two forms, anhydrous and crystalline. The colorless crystallized strontium bromide when dried at 110°C . lost 10.02 per cent. water, at 150°C . 20.02 per cent., and when heated to 300°C . 30.43 per cent. The formula $\text{SrBr}_2 + 3\text{H}_2\text{O}$ requires 17.5 per cent. water, $\text{SrBr}_2 + 6\text{H}_2\text{O}$, 30.43 per cent. It is evident that the salt combines with the water of crystallization with difficulty, losing it only at the melting point. The alcoholic solution of the salt does not react with phenolphthalein, but the aqueous solution does, this being due to dissociation. The so-called *strontium bromide* occurs as a white powder. In the experiment it contained 10.02 per cent. of water at 110°C ., 5.82 per cent. at 150°C ., and 3.02 per cent. at the melting point. The formula $\text{SrBr}_2 + \text{H}_2\text{O}$ requires 10.02 per cent. H_2O . The melted salt was light-brown in color, and was soluble in water, hence the salt examined cannot be anhydrous. Other samples of strontium bromide (anhydrous, so called) were also examined and found to contain more or less water, and also contained appreciable quantities of barium.—Pharm. J., 1891, 355; from Farmazest, 1902, No. 101, 260.

C. P. Iodine—Preparation.—A. Ladenburg prepared

follows: Pure potassium iodide, containing not more than 0.07 per cent. potassium chloride, is converted into silver iodide and this, after washing, shaken occasionally during 24 hours with concentrated ammonia solution, which removes the last traces of silver chloride. The pure silver iodide is then completely washed on a suction filter, converted into zinc iodide by reduction with zinc and sulphuric acid in the cold, and liberating the iodine from this by means of nitrous acid. The iodine so liberated is twice distilled with the vapor of water, and finally dried over calcium chloride. Iodine so purified is darker and less volatile than the ordinary article of commerce. It melts at 116.1°C. , boils at 183.05°C. , and has the sp. gr. 4.933.—Pharm. Ztg., May 7, 1902, 335; from Ber. d. D. Chem. Ges., 1902, 1256.

Hypoiodous Acid—Yield Dependent on Manipulation.—Referring to the observations made by Orton and Blackman that the solutions obtained from iodine by the action of mercuric oxide contained only a small quantity of hypo-iodite, and that the iodine was chiefly present as iodate, R. L. Taylor states that these observations are contrary to the results previously obtained and described by him. He finds that on using powdered iodine (2 parts to 1000 parts of water) and occupying fifteen minutes in shaking and ten minutes in filtering, the results are not very different from those described by Orton and Blackman; but if the iodine is employed in the finely divided form obtainable by precipitation, used in the same proportions, and taking only a little over a minute in shaking and filtering, only 5 to 10 per cent. of the iodine was converted into iodic acid, 90 to 95 per cent. existing in the liquid as hypo-iodous acid. In his previous experiment he had obtained 80 to 90 per cent. of the possible amount of hypo-iodite. The solution of hypoiodous acid decomposes very rapidly, beginning to turn brown almost immediately after filtering, unless a very dilute solution of iodine is employed; hence all the operations must be performed very quickly.—Pharm. Journ., April 12, 1902, 293; from Proc. Chem. Soc., 18, 72.

Iodides—Preservation in an Atmosphere of Carbon Dioxide.—As is well known certain iodides, such as strontium and ammonium iodide, are readily decomposed by the influence of light and air, becoming yellow and eventually brown. Mantier proposes their preservation in an atmosphere of carbon dioxide, which deserves mention although the described method is not free from objection. He places some sodium bicarbonate or ammonium carbonate (? Rep.) into the container, covers this with a layer of cotton-wool and then fills it with the iodide. The open container and contents are then heated on a water-bath at a boiling temperature; the air becomes attenuated, and is finally replaced by the liberated carbonic acid from the bicarbonate (or ammonium carbonate), whereupon it is hermetically closed.—Pharm. Ztg., Dec. 4, 1901, 964; from Journ. de Pharm. d'Anvers., Nov., 1901.



comes yellow or white. ZnS and CdS under like conditions give a similar product, containing blue grains. This blue sulphur is considered by N. A. Orlov to be S_8 , standing in the same relation to ordinary sulphur as ozone does to oxygen. The presence of benzene or of carbon disulphide is not essential to its formation. It may also be obtained by the use of toluol. With cadmium sulphide the reaction may be expressed by the equation $CdS + S_2Cl_2 = CdCl_2 + S_8$. With bismuth sulphide the composition of the precipitate is very variable, containing from 0 to 0.90 per cent. of $BiCl_3$.—Pharm. Journ., Feb. 15, 1902, 121; from Chem. Centralblatt., 72, 522.

Hyposulphites—Products of Reaction with Hydrogen Peroxide.—On mixing equimolecular portions of peroxide of hydrogen free from H_2SO_4 and of a solution of sodium hyposulphite, A. Nabl observed that the liquid became sensibly warmer and acquired an alkaline reaction. Equal molecules of sulphate and sulphite of sodium were formed, as well as a basic substance oxidizable by an excess of H_2O_2 and not very stable, as the liquid when left to itself soon becomes cloudy and gives off SH_2 . An attempt was made to isolate this sulphurized base by acidulating with hydrochloric acid after the action of the H_2O_2 was completed, then evaporating to dryness on the water-bath, taking up with water, filtering, and precipitating with $HgCl_2$. A partial reduction of the salt takes place; the base gives a double mercurioso-mercuric salt, which, after washing, was treated with SH_2 . The filtered solution was evaporated almost to dryness on the water-bath, and on the addition of alcohol and dilute sulphuric acid, a fine flocculent white precipitate of a sulphate was formed. This last salt was collected on a filter, washed with etherized alcohol, re-dissolved in water, then treated with carbonate of baryta, when it gave a colorless liquid with a green fluorescence and having a strongly alkaline reaction; the return is not good. This substance precipitates the metallic oxides from their saline solutions, reduces Fehling's Solution slowly when warmed, and with $SnCl_4$ gives stannous sulphide. Its chloro-platinate becomes reduced slowly and spontaneously in the cold, but rapidly when warmed. It is probable that this base contains the radical SOH and can be compared with Cahours' hydrate of trimethylsulphine, or again with hydroxylamine.—Chem. News, Jan. 17, 1902, 36; from Berichte, Vol. 33, p. 3093.

Sulphuric Acid—New "Contact Method" for its Manufacture.—Prof. Samuel P. Sadtler gives an interesting explanation of the new "contact method" for the manufacture of sulphuric acid, which has been developed and recently patented by the Badische Anilin und Soda Fabrik. The chemical reaction underlying the production of sulphuric acid is an extraordinarily simple one. It merely involves the union of sulphur dioxide with an atom of oxygen to form sulphur trioxide, and this takes up moisture with avidity to form the molecule of sulphuric acid; but this reaction takes place very slowly, unless aided by some catalytic-acting material. In the well-known lead-chamber process, this material acting as a carrier

SELENIUM HYDRIDE.

of oxygen is a mixture of the oxides of nitrogen. Not for over a century as the only process capable of being manufactured on a large scale, it is likely to be replaced by what is now being done, although there is no difference in the fundamental principle. It merely replaces the gaseous carrier of oxygen by a solid body, and by its catalytic action brings about the same change. Sulphur trioxide, with this advantage, however, that it is a solid substance, acting at a higher temperature, can bring about the same change in the absence of water and thus produce at once a stronger acid, or even sulphuric anhydride itself as a solid body. While this catalytic action of a solid body in the form of a contact mass has long been known and recognized, the difficulties attending its industrial application have hitherto been so great that it has not been practicable to compete with the chamber process. After years of an immense amount of time, patience and money, and after the Soda Fabrik have now devised a method which has been so successful that they have been enabled to increase the production of hydride from 18,500 tons in 1888 to 116,000 tons in 1902. Of exact details, withheld, it may suffice here to say, that no poisonous gases are employed. These, contrary to the old process, are diluted with nitrogen without interference with the reaction. The presence of even small quantities of solid impurities, such as iron, copper, lead, zinc, etc., acts injuriously; the most injurious substance, however, is arsenic, even traces of this element will injure the contact mass. In the process developed, these impurities have been carefully and absolutely eliminated. This is accomplished by various methods of cooling and washing, and particularly by making the gases traverse a long distance before they reach the contact mass. The trioxide here formed, is rapidly absorbed in a vessel containing 10 per cent. sulphuric acid, and from this removed from the acid as pure trioxide, or after the addition of water, to produce sulphuric acid of any concentration, or mixture of the acid and sulphur trioxide in any proportions. The contact mass that has been found to be best under all necessary conditions, is platinum. The incentive to the development of this practical contact process was the need of producing sulphuric acid for the cheaper manufacture of potassium bichromate and especially the new synthetic indigo, but the process is now being used advantageously with the chamber process for all grades of acid.

—Amer. Jour. Pharm., June, 1902, 285-289.

SELENIUM.

Selenium Hydride—Preparation and Properties.—Fonze and Discon obtain perfectly pure H_2Se by the action of hydrogen on selenium, and if the latter be in excess, the gas

free from moisture. Thus obtained it boils at -42°C. , and a little below -40°C. condenses to a colorless liquid which solidifies at -64°C. The density of the gas at -42°C. is 2.12. It is very soluble in water, 3.31 volumes dissolving in one volume of that liquid at normal atmospheric pressure at 13.2°C. , 3.77 volumes at 4°C. , and 2.7 volumes at 22.5°C. —Pharm. Journ., Mar. 15, 1902, 213; from Comptes rend., 134, 171.

Selenic Acid—Action on Gold.—Victor Lehner found pure selenic acid, H_2SeO_4 , obtained by decomposing lead selenate with H_2S and concentrating by evaporation, to be without action on gold in the cold, but that hot concentrated selenic acid readily dissolves the metal. The action begins at 230°C. , but proceeds more rapidly at 300°C. , SeO_2 being evolved and Au_2SeO_4 formed. It occurs in very small yellow crystals, insoluble in water but soluble in hot H_2SeO_4 , so that it may be precipitated from solution in that acid by the addition of water. The reaction is similar to that of H_2SO_4 on copper, and is the first recorded instance of the solution of gold in a simple oxy-acid.—Journ. Amer. Chem. Soc., 24, 355.

PHOSPHORUS.

Red Phosphorus—A Product of Polymerization.—The investigations of R. Schenk lead him to the conviction that red phosphorus must be regarded as being a product of the polymerization of white phosphorus; the allotropy of phosphorus consists of a polymery, not of a polymorphy. The investigations, however, do not lead to the conclusion that the formula of red phosphorus is P_8 ; it is assumed that preliminarily a very loose compound P_8 is found, and that this rapidly acquires a higher polymerization.—Pharm. Ztg., March 26, 1902, 240; from Ber. d. D. Chem. Ges.

Phosphorous Oxide—Conditions of Formation.—A. Besson has obtained phosphorous oxide, P_2O , as follows: Hydrobromic acid gas is dissolved in pure cold phosphoryl chloride, and through this a current of PH_3 gas is passed; phosphonium bromide is formed, accompanied by the deposit of a small quantity of yellowish solid. By gently raising the temperature above 50°C. , and keeping the whole on the water-bath for some hours, a voluminous precipitate forms, which can be separated out by filtration. This precipitate, after precipitation, was found to have the composition P_2O .—Chem. News, July 19, 1901; from Compt. rend., 1901, No. 25.

Hypophosphites—Ammonium Molybdate Test Liable to Fallacy.—The ammonium molybdate test for the presence of hypophosphites, which was originally recommended by Millard, is directed to be made by adding ordinary nitric solution of ammonium molybdate to a hypophosphite solution, and then a little sulphurous acid. A blue color is said to result, or, in very dilute solutions, a blue color dependent on shaking or gently warming. F. A. Upsher Smith, however, states that it is noteworthy that water acidulated with hydrochloric or sulphuric acid gives with ammonium molybdate a faint indication of blue which might be mistaken for traces of

a hypophosphite. Still more important is it to note that solution gives a blue color with a solution of ammonium should not, therefore, be used in performing the test. A of a hypophosphite gives with ammonium molybdate solution without warming, if left standing over night.—Pharm. 1902, 143.

Referring to the above criticism of the ammonium molybdate test for hypophosphites, E. J. Millard states that the test is reliable under the conditions originally mentioned by him. The reagent is prepared as follows: Dissolve 1 part of molybdic acid in a solution of ammonia B. P., and pour into 15 parts of nitric acid of specific gravity 1.2. The solution gradually deposits, and the supernatant liquid be poured off. If this solution be employed in testing hypophosphites or hypophosphorous acid, there is no difficulty in obtaining the characteristic precipitate or color when a few drops of sulphurous acid are subsequently added. With this solution no color is given on the addition of diluted nitric or sulphuric acids, as stated by Mr. Smith to occur with ammonium molybdate, nor does sulphurous acid alone give with this solution. That it gives a blue color with a hypophosphite on standing for a few hours is correct, but the addition of sulphurous acid develops the color immediately. Mr. Millard adds, for the purpose of clearing up the best proportions for the tests are as follows: 0.1 Gm. of hypophosphite dissolved in 2 Cc. of water, add 1 Cc. of the strong solution of molybdate and 2 drops of sulphurous acid. An immediate blue color occurs, rapidly turning into a heavy precipitate. An insufficiency of the test solution is to be avoided, as, although a blue color appears, it becomes brown or colorless more or less quickly. The delicacy of the test is well shown by dissolving 0.1 Gm. of hypophosphite in 100 Cc. of water. 2 Cc. of this solution containing 0.002 Gm. of the salt, to which 2 drops of the reagent is added, and 2 drops of sulphurous acid, will develop a deep blue color on standing. Tests for hypophosphites are not sufficiently numerous or delicate that we can afford to do away with one that is both distinct and accurate.—*Ibid.*, Mar. 8, 1902, 201.

Commercial Meta-Phosphoric Acid—Monosodic Diorthophosphate Impurity.—H. Giran finds that the crystals which appear in commercial metaphosphoric acid kept in imperfectly closed vessels are composed of a new sodium hydrogen phosphate, $\text{NaH}_5\text{P}_2\text{O}_8$, as stated by E. Zettnow, a peculiar variety of pyrophosphate. The composition of the sticks themselves is found to correspond to the formula $\text{NaPO}_3 + \text{HPO}_3$, which, by combining each with one molecule of H_2O , give the new salt $\text{NaH}_5\text{P}_2\text{O}_8$, or, it may be, a combination of NaH_2PO_4 .—Pharm. Journ., April 19, 1902, 313; from *Pharm. Journ.*, 1902, 711.

Meta-Phosphoric Acid—A Valuable Reagent for the Detection of Albumen in Urine.—Which see under "Organic Chemistry."

Sesquisodic Phosphate—Question of Existence.—From the fact that when orthophosphoric acid is titrated with alkali, helianthin turns from red to yellow when one equivalent of soda has been added, litmus changes with 1.5 equivalents, and phenolphthalein with two equivalents, H. Joulie concluded that a sesquisodic phosphate, $\text{Na}_3\text{H}_3\text{P}_2\text{O}_8$, must exist, intermediate between the monosodic phosphate, as shown by helianthin, and the ordinary disodic phosphate. He found, in fact, that by adding sufficient orthophosphoric acid to crystals of that salt to render it neutral to litmus, a great lowering of temperature took place; on concentrating, crystals were obtained, consisting of oblique prisms which, after drying, responded to the formula $\text{Na}_3\text{H}_3\text{P}_2\text{O}_8$. This salt is stated to be much more suitable for therapeutic use than ordinary disodic phosphate, since it is more soluble, is active in smaller quantities, being tonic in doses of 15 grains, laxative with 75 grains, and purgative with 150 grains. Its taste is saline, neutral, and scarcely unpleasant. Although the author describes it as a new salt, J. B. Senderens points out, in a subsequent communication, that it has previously been described by himself and Filhol, and that, if dried *in vacuo* over H_2SO_4 , it contains 3 molecules of H_2O ; when exposed to a current of dry air at ordinary temperature it retains 15 molecules of water of crystallization.—Pharm. Journ., June 27, 1902, 549; from Comptes rend., 134, 604 and 713.

Sodium Phosphate—Examination for Arsenic.—Frederick T. Gordon, in response to a "query," has made an examination of six different samples of sodium phosphate procured in retail stores in order to verify the presence or absence of arsenic in them. He found them to be free from arsenic by the U. S. P. tests, but two of them showed traces of this element by the methods of Dowzard and Cady (see Proceedings, 1901, 794) for the detection of arsenic in glucose and sodium phosphate. The reduction and mercuric chloride test-paper method was found to be quite delicate and satisfactory.—Proc. Pa. Pharm. Assoc., 1901, 121, 122.

Calcium Phosphate—Examination of Commercial Samples.—Frederick T. Gordon has subjected nine samples of precipitated calcium phosphate, procured at retail stores, and three samples direct from jobber's packages, to examination in order to reply to a "query" concerning the commercial quality of this compound. Among these only one sample failed to come up to the U. S. P. requirements; it contained about 20 per cent. of calcium sulphate. Minute quantities of arsenic were found in two samples.—Proc. Pa. Pharm. Assoc., 1901, 120.

Calcium Phosphate—Adulteration with Calcium Carbonate.—Lyman F. Kebler notes an adulteration of calcium phosphate with calcium carbonate to the extent of 30 per cent.—an adulteration which in some operations,

such as the preparation of laudanum, for instance, would cause an endless amount of trouble.—Amer. Journ. Pharm., Jan., 1902, 13.

Bicalcic Phosphate—Solubility.—The constants of solubility of different phosphates of lime being very incomplete and even contradictory, A. Rindell has undertaken the investigation of the subject by modern methods. He employed a very pure salt, finely pulverized, and having the following composition: CaO , 32.70; P_2O_5 , 41.30; H_2O , 26.20 per cent. The numbers obtained show clearly (1) that the concentration of the solution increases with the time and the mass of the salt in contact with a given volume of water; (2) the quantity R at first differing but slightly from unity increases with the concentration.—Chem. News, Feb. 7, 1902, 71; from Compt. rend., Jan. 13, 1902.

Manganic Phosphates—Formation and Composition.—V. Anger has investigated the components of the violet solution which forms the product of fusion of manganese nitrate and phosphoric acid heated to about 210°C . The molten mass, when dissolved in water and left for some days, deposits a rose-colored crystalline crust, manifestly a mixture of two or three products. Herrmann analyzed a portion of this crust and found it correspond to the formula $\text{Mn}_4\text{P}_6\text{O}_{21}\cdot 8\text{H}_2\text{O}$. The author isolates from the same mass a hydrated salt in a pure state, and finds it to have a formula differing from Herrmann's only in the amount of water of crystallization, $\text{Mn}_4\text{P}_6\text{O}_{21}\cdot 14\text{H}_2\text{O}$. The salt is certainly a pyrophosphate, for when treated in the cold by an alkali, it gives an alkaline phosphate which possesses all the reactions of pyrophosphoric acid. Manganic metaphosphate, MnP_3O_9 , was also isolated from the crust and found to be anhydrous.—Chem. News., Aug. 2, 1901, 60; from Compt. rend., July 8, 1901.

Phosphorus Sesquisulphide—Failure to React with Mitscherlich's Test.—E. G. Clayton has examined various specimens of commercial phosphorus sesquisulphide, and applied Mitscherlich's test to each in the following way: 20 Gm. of the compound was distilled with 100 Cc. of 10 per cent. sulphuric acid in an egg-shaped flask connected with a spiral condenser, the operation being conducted in a dark room. The very small amount of light emitted by the lamp was screened from the condenser and receiver, which were in complete darkness. In each case 40 Cc. of liquid was distilled over. The results with comparatively pure specimens were absolutely negative, not the faintest luminosity being perceptible in any part of the apparatus, and it is said to be evident that pure, or even approximately pure, phosphorus sesquisulphide gives no reaction with Mitscherlich's test, though very crude specimens of phosphorus sesquisulphide no doubt occasionally give Mitscherlich's reaction. The author is now conducting some experiments with the object of discovering whether exposure and keeping can so induce partial oxidation in, or alter the composition of pure, or nearly pure, phosphorus sesquisulphide as to impart to it after a time the property of giving Mitscherlich's reaction.

Meanwhile, the absence both of free phosphorus and of phosphorous oxide from phosphorus sesquisulphide of fair quality and purity and comparatively recent manufacture was clearly indicated by the negative reaction with Mitscherlich's test.—Pharm. Journ., June 21, 1902, 529; from Proc. Chem. Soc., 18, 129.

BORON.

Boron—Conversion into Silicon (? Rep.).—As a matter of record it may be here noted that F. Fittica, who has heretofore announced the convertibility of arsenic into phosphorus (see Proceedings, 1900) now announces that he has succeeded in transforming boron into a non-saturated silicon oxide (SiO) and boric acid into silicic acid (H_4SiO_4). It is, however, pointed out by C. Counciler, in the same journal, that if the identity of B with SiO is correct, the vapor densities of the fluorine BF_3 and the chlorine compound BCl_3 , should be four times as great as those that have been established. He expresses the opinion that Fittica's results are due to impurities in the boron or the reagents, or that the silica may have been derived from the porcelain vessels employed.—Pharm. Centralh., Dec. 19, 1901, 804; from Chem. Ztg., Oct., 1901, 929.

Boric Acid—Use of Methyl Alcohol to Facilitate its Titration.—It is known that the presence of glycerin or mannite is necessary for the accurate determination of boric acid by titration with standard alkali. K. Farnsteiner now finds that within a certain degree of concentration methyl alcohol serves the same purpose, but ethyl alcohol does not. Any variation in the normal results obtained when boric acid is titrated with methyl alcoholic alkali in the presence of methyl alcohol is ascribed to the presence of a little water, which, moreover, is always produced in titrating boric acid with an alkali thus: $H_3BO_3 + NaHO = NaBO_2 + 2H_2O$. Methyl alcoholic baryta solution yields better results owing to the separation of an insoluble barium salt which contains combined water and thus removes a portion of the water formed in the reaction. If the statement is correct that a volatile ester is produced when boric acid is distilled with methyl alcohol it is remarkable that the ester so easily formed is immediately decomposed on neutralization with alkali. Borax in methyl alcohol also behaves as in the presence of glycerin in showing that borax is an acid salt containing two molecules of free acid and two molecules of combined boric acid. The observations of several authors that more than half of the boric acid is easily volatile when borax is distilled with methyl alcohol is probably due to the further decomposition of the salt $NaBO_2$ by the water of crystallization in the borax. When methyl alcohol sulphuric acid is added to borax dissolved in methyl alcohol until a red color is obtained with methyl orange, the whole of the boric acid can be obtained in the distillate, and this process is available in the presence of much chloride, thus avoiding the presence of hydrochloric acid in the distillate. Ethyl alcohol has

the same effect as water in preventing the combination of boric acid with alkali. The different behavior of the two alcohols shows that it is a specific action of the menstruum which has the function of producing a monobasic acid from H_3BO_3 , and in the case of methyl alcohol it is probably due to the more prominent position of the hydroxyl group in the molecule; that is, on the supposition that glycerin and mannite exert their action by the hydroxyl groups.—Pharm. Journ., Mar. 1, 1902, 173; from Ztschr. f. Unter. d. Nahr. u. Genussmittel, 1902, No. 1.

Boric Acid and Borax—Proposed Volumetric Tests.—Thomas S. Barrie proposes the following volumetric tests for boric acid and for borax, which are based upon the process devised by R. T. Thomson in 1894, for the purpose of their introduction into the B. P.:

Boric Acid: One gram of the acid dissolved in 50 cubic centimeters of warm distilled water should require, after the addition of 50 grams of glycerin and a few drops of phenol-phthalein solution, 16.25 cubic centimeters of volumetric solution of sodium hydroxide for neutralization.

Borax: One gram of borax dissolved in 40 cubic centimeters of distilled water should require for exact neutralization (indicator, methyl orange), 10.55 cubic centimeters of semi-normal sulphuric acid, and after boiling and addition of 50 grams of glycerin should now require 10.55 cubic centimeters of normal sodium hydroxide solution to exactly neutralize (indicator, phenol-phthalein).

The author finds it advisable to standardize the alkali used in the above titration with boric acid in order to obtain correct results.—Pharm. Journ., April 26, 1902, 345.

SILICON.

New Silicon Hydride—Formation and Properties.—H. Moissan and S. Smiles announce the isolation of a new compound of silicon and hydrogen, Si_2H_6 . It is obtained by the action of dilute HCl on pure magnesium silicide, and passing the gas generated through a tube surrounded by liquid air; when the temperature falls to between $-180^\circ C.$ and $-200^\circ C.$ a solid body is formed, and the issuing gas loses its property of being spontaneously inflammable in atmospheric air, being, in fact, pure hydrogen. If the solid body is now submitted to fractional distillation, as the temperature rises it boils and gives off gaseous siliciuretted hydrogen, and leaves, at the temperature of the laboratory, a liquid which is the new hydride, Si_2H_4 . This body boils at $+52^\circ C.$; at $-138^\circ C.$ it crystallizes and solidifies. On contact with the air it spontaneously ignites, burning with a very bright flame. It also imparts to hydrogen the property of becoming spontaneously inflammable, even when present in that gas in small quantities. It also burns in chlorine. Friedel and Ladenburg have shown that pure SiH_4 does not ignite spontaneously at ordinary temperatures, so that the burning of siliciuretted hydrogen in the air must be due to the

presence of this body, just as a little liquid PH_3 causes the spontaneous ignition of much PH_3 .—Pharm. Journ., May 17, 1902, 410; from Compt. rend., 134, 569.

Silicic Acid—Medicinal Use.—As the result of an extensive investigation, Hugo Schulz has determined silicic acid to be a constituent of the tissues of the human and animal body, as well as of the excrements, and that it is invariably a constituent of the connective tissues. Its pronounced relation to the latter leads the author to the assumption that silicic acid may prove of considerable therapeutic value in cases of affections of the connective tissue, and of other organs, in the development of which it may be concerned.—Pharm. Centralh., Aug. 8, 1901, 492; from Arch. f. d. ges. Physiol., 84.

Asbestos—Loss of Weight on Ignition.—The observation made by Neubauer that asbestos loses some weight on heating to full ignition has been confirmed by recent experiments made and recorded by H. Thiele.—Pharm. Ztg., Nov. 9, 1901, 896; from Ztg. f. öffentl. Chem., 1901, No. 7.

Asbestos—Analysis of Different Kinds.—E. G. Clayton has analyzed four kinds of asbestos, one of which (A) was stated to be of English origin, and consisted of long, greyish-green fibres, easily separable, and resembling Italian asbestos in appearance, though characterized by unusual bitterness. The other samples (B, C and D) were the ordinary mineral, which had been pulverized and were apparently associated with a little gypsum. All four possessed the general composition distinctive of true amphibole-asbestos, as is evidenced by the following:

	A.	B.	C.	D.
Water lost at 100° C.....	1.19	0.87	0.86	—
Water lost at 150°	0.05	0.13	0.00	—
Water lost at a red heat	0.70	0.95	1.83	—
Total water	1.94	1.95	2.69	1.39
Silica (with traces of MnO_2 , alkalies, etc.)...	60.88	48.48	59.82	61.74
Lime	11.11	6.19	5.91	6.91
Magnesia	10.84	35.52	28.27	25.72
Alumina	trace	4.69	1.25	2.30
Iron oxide ...	15.23			
Sulphuric anhydride.....	—	3.17	2.06	1.94

—Pharm. Journ., Nov. 23, 1901, 575; from Proc. Chem. Soc., 17, 203.

Calcium Silicide—Characters.—Moissan and Diltney have investigated the characters of calcium silicide, with the particular object of deciding the contradictory statements of Wöhler and of Jacobs concerning the action of water upon it. Wöhler, who first obtained calcium silicide, de-

scribed it as being attacked with difficulty by water, while, stated that it is rapidly decomposed by water. In its present authors find it necessary to use an excess of silicon formation of silicate. A mixture of equal parts of lime and in a carbon tube in the electric furnace, the molten mass in contact with the carbon for as short a time as possible, to avoid much calcium carbide, or, finally, carbon silicide. The mass cooled is not homogeneous; the external portion consists of carbide; then a whitish layer of crystalline calcium silicate; finally, in the middle, a brilliant button of CaSi , mixed with quantities of silicon. With the proportions above indicated an excess is ensured, since a considerable quantity of the lime used is converted into carbide or silicate. Calcium silicide thus obtained occurs as greyish crystals of a metallic aspect, having the sp. gr. 2.5. It is permanent when heated to redness in hydrogen, takes fire in air, is attacked by chlorine in the cold, but ignites in a current of oxygen when heated to redness. Bromine and iodine behave in a similar manner. In the air it is superficially attacked only on heating, the use of the oxy-hydrogen blow-pipe is necessary for its complete oxidation. It is also only superficially attacked when heated to redness in pure oxygen. It is permanent in dry, and only very slowly altered when powdered and placed in water; it decomposes very slowly with the liberation of hydrogen. Cold gaseous HCl is without action, but on red heat it combines, forming calcium and silicon chlorides. A concentrated solution of HCl in the cold, attacks it, forming hydrogen, hydrogen chloride and Wöhler's silicon. The dilute acid gives off hydrogen, only silicon and hydrogen. Alkaline solutions dissolve it with the evolution of hydrogen.—Pharm. Journ., 1901, 294; from Comptes rend., 134, 503.

CARBON.

Carbon Dioxide—Preparation in a C. P. Condition.—A recent French patent, chemically pure carbon dioxide is prepared by converting it as obtained from any source into an alkali-bisulfate, and then subjecting this to electrolysis. This results in the formation of carbon dioxide which may be used again, and a mixture of carbon dioxide and hydrogen which may be used again. The carbon dioxide is liquefied by compression and cooled to -10°C . The *pure oxygen* as a by-product. It is questionable, however, whether the oxygen is actually pure and free from carbon dioxide. Pharm. Ztg., Nov. 20, 1901, 925; from Chem. Ztg., 1901, 19.

Carbon Dioxide—Utility in the Compressed, Solidified Form.—W. Schaefer calls attention to some valuable properties of carbon dioxide as a carbonic acid, in addition to those which have found useful applications in the arts and industries. He finds that the carbonic acid “s

safely hammered into any shape or form, and can therefore be compressed by the aid of machinery into various forms and sizes. In its solidified form it is so exceedingly plastic that it can be rolled out in thin sheets, and any desired characters in the form of letters and figures may be stamped upon it. It will sink in water, and when dipped in water and then taken out, its external surface assumes the appearance as if it were glazed. It is more durable than ice, for it may be exposed to the air for a longer time without much of it evaporating. In the form of cakes or blocks it may be stored in an ordinary ice box, and it may be used for nearly all purposes for which ice is now used. Moreover, it can be handled with impunity, because in its solid condition it is completely surrounded by a nebulous or gaseous envelope of CO_2 , and is therefore not in immediate contact with the cutaneous surface. It is readily transported in bags of canvas, or in felt, asbestos, or any other good non-conductor. In the form of tablets it may be conveniently used for carbonizing water by simply dropping one into a bottle containing pure water; but if added to water in large quantity it will refrigerate it so as to form solid ice.—Merck's Rep., May, 1902, 187, 188.

CYANOGEN COMPOUNDS.

Bromo-Cyanogen—Industrial Preparation.—Heretofore bromo-cyanogen has been required in small quantities, being prepared experimentally by the action of potassium cyanide upon refrigerated bromine; but since the industrial application in quantities for the extraction of gold, the experimental method is no longer applicable. C. Göpner has now prepared it successfully in quantities by treating a mixed solution of sodium bromide, sodium bromate and potassium cyanide with diluted sulphuric acid at a temperature of 70° ; one half of the bromide is then converted into bromo-cyanogen, BrCN , and the other half is retained as sodium bromide. He obtains the best results, however, when 2 mol. of NaBr , and 1 mol. of NaBrO_3 are employed, the reaction occurring in accord with the following equation:



—Pharm. Ztg., Nov. 23, 1901, 934.

Cyanic Acid—Products of Polymerization.—A. Senier and T. Walsh state that "cyamelide" is not the only product of the polymerization of liquid cyanic acid, two isomerides, "cyamelide" and "cyanuric" acid, being formed. These can be separated by treatment with water. Pure "cyamelide" dissolves in water to the extent of only 0.01 per cent. at 15° , while "cyanuric" acid is soluble to the extent of 0.145 to 0.16 per cent.—Pharm. Journ., Feb. 1, 1902, 82; from Proc. Chem. Soc., 18, 13.

Cyanide—Extraction in the Presence of Chloride.—Frank B. Gatehouse proposes a volumetric process for estimating a cyanide in the presence of

chlorides, which is based upon the fact that when a solution of silver nitrate is added to a solution of KCN in the presence of KCl (or NaCl) no precipitate is formed whilst any KCN remains in solution ; but as soon as the silver solution has been added in quantity, more than sufficient for the formation of the double cyanide, a precipitate is produced. The estimation is carried out as follows: Measure out a definite amount of the solution containing the cyanide and chloride. Run into it from a burette a decinormal solution of AgNO_3 , until a permanent turbidity appears. At this stage of the process each Cc. of AgNO_3 solution which has been used will correspond to 0.013036 Gm. of KCN. Note the reading of the burette, and run into the solution the same volume of silver solution as was required to form the permanent precipitate, and again note the reading. From this point the AgNO_3 added is used in precipitating the chloride. Then add a few drops of K_2CrO_4 solution free from chloride, and judging the end of the reaction by the appearance of the dark red silver chromate, estimate the chloride in the usual manner.—Chem. News, Oct. 25, 1901, 197.

Soluble Blue—Adulteration and Sophistication by Ultramarine.—The low price at which “soluble blue” was offered on the market, led Robert C. Pursel and Willard R. Graham to subject it to examination. They found only a small per cent. of the article to be soluble, and that it consisted almost entirely of ultramarine blue.—Amer. Journ. Pharm., Nov., 1901, 556.

Soluble Blue—Determination of Sophistication by Ultramarine.—Lyman F. Kebler observes that soluble blue is sometimes substituted by ultramarine. This substitution may be recognized by the insolubility of the latter, but care must be taken not to be deceived, inasmuch as the ultramarine blue is a very fine powder and remains suspended in the water some time. By allowing the solution or mixture to stand for twenty-four hours, a permanent blue solution remains if the article is soluble blue, while, if it is ultramarine, this subsides and leaves a colorless supernatant liquid.—Amer. Pharm. Journ., Jan., 1902, 14.

Cupric Sulphocyanate and Sulphocyanide—Ammonia Compounds.—Referring particularly to the previous work of Meitzendorff (1842) upon the ammonium compounds of cupric sulphocyanate and sulphocyanide, F. M. Litterscheid communicates the results of his investigation undertaken with the object of throwing further light upon the nature and composition of these compounds. He finds that the

Cupric Sulphocyanate-Ammonia has essentially the characters and the composition attributed to it by Meitzendorff. It occurs in blue needle-shaped crystals having the composition $\text{Cu}(\text{NH}_4\text{CNS})_2$, but it is not necessary to prepare it from the cupric sulphocyanate ; it suffices to add dilute ammonia and solution of ammonium sulphocyanate to a solution of

cupric sulphate, washing the crystalline crusts obtained with water, redissolving them in warm ammoniacal water, and adding an equal volume of alcohol, whereupon the pure salt separates out in shining, permanent aggregations of blue crystals. Besides this compound, however, a compound very much richer in ammonia is obtainable, if the before-mentioned compound, $\text{Cu}(\text{NH}_3.\text{CNS})_2$, is dissolved in the strongest solution of ammonia and allowed to stand, or if a concentrated solution of cupric sulphate is treated with 25 to 30 per cent. NH_3 and a sufficiency of ammonium sulphocyanate. Rhombic tabular crystals of a deep blue color separate, but then soon lose their brilliancy owing to the loss of ammonia when exposed to the air. The new compound has the composition $\text{Cu}(\text{NH}_3.\text{CNS})_2 + 2\text{NH}_3$.

Cupric Sulphocyanide-Ammonia was not obtainable in a condition suitable for analysis. As described by Meitzendoiff, cupric sulphocyanide gradually forms a blue solution when it is boiled for some time with ammonia, and the hot filtrate deposits large, strongly glistening needles; but these when collected on filter paper soon acquire a grey or greenish color and lose their brilliancy. They have been proven, however, to contain aminonia, and if kept exposed to the air for some time this is lost completely, cupric sulphocyanide remaining.—Arch. d. Pharm., 239, No. 5 (July 6, 1901), 336–340.

Selenocyanic Compounds—Preparation and Characters.—W. Muthmann and E. Schröder have prepared and studied the characters of several selenocyanic compounds. The

Selenocyanate of Potassium is prepared as follows: An intimate mixture of 70 grams of pure KCy with 79 grams of finely powdered commercial selenium is melted at as low a temperature as possible. Take up with 40 Cc. of water, and heat on the water-bath for three or four hours, renewing the water when necessary; then evaporate to dryness with constant stirring, and take up with 1 liter of boiling absolute alcohol; a current of CO_2 is then passed through the solution for two hours. Filter, drive off the alcohol by distillation, and dry the crystals of KC_ySe ; the return should be from 96 to 98 per cent. In this manner all loss of selenium is avoided.

Cyanogen Triselenide is prepared as follows: Crystals of selenocyanate of potassium are placed in a flat-bottomed vessel with one-third to one-half their weight of water, and a current of peroxide of nitrogen gas is passed over the mass, taking care to stir frequently, and to keep the temperature down to 0°C . The mass first becomes red, and red crystals are formed having a blue metallic appearance by reflected light; these consist of $\text{Cy}_3\text{Se}_4\text{K}$, and have been described by Verneuil; they afterwards become yellow, and increase considerably in volume. Towards the middle of the operation it is as well to add, small quantities at a time, of fuming nitric acid; this causes the mass to become very frothy: Cy_2 and HCy are given off. When this reaction is terminated the residue is rapidly drained, then

washed with very little water, and finally dried on porous desiccator. In this manner a mixture of nitre and triselenide is obtained, which is treated with boiling benzene to dissolve it. On cooling it is deposited in yellow flakes or needles which melt at 132°C ., forms a deep yellow liquid, and decomposes when heated in a tube it gives a sublimate of selenium and a residue perfectly insoluble in water, but is decomposed by it, forming a black sulphide of carbon. Analysis and ebullioscopic examination give the formula $\text{C}_2\text{N}_2\text{Se}_3$.—Chem. News, Nov. 8, 1901, 223; xxxiii, 1765.

ALKALIES.

Potassium—Detection with Sodium Picrate.—G. Reichenow states that when two per cent. solutions of potassium salts are treated with a solution of sodium picrate, an abundant precipitate is produced, and that this reaction is available for the detection of potassium. To apply the test successfully the solution must be neutral—alkaline bicarbonates must be neutralized with hydrochloric acid—must contain only salts of sodium and lithium besides potassium. Pharm. Journ., Sept., 1901, 409; from Ztschr. f. Anal. Chem., 40, 390.

Potassium Hydride—Preparation and Properties.—By passing threads of metallic potassium in a current of pure hydrogen through a tube, to a temperature of 360°C ., H. Moissan has succeeded in the cooler portion of the tube, a crystalline sublimate of potassium hydride, KH , in the form of delicate white needles. Potassium hydride is one of the most unstable bodies known. It combines at once with atmospheric moisture liberating hydrogen and potassium. It reacts with cold water without incandescence, hissing like a red-hot metal, with a tumultuous evolution of hydrogen. It is insoluble in turpentine, ether and carbon disulphide. Its density is about 0.80. It is stable when heated *in vacuo* to below a dull red heat. It immediately reacts in contact with fluorine, and with oxygen, and becomes incandescent in chlorine, and takes fire immediately in atmospheric air. It is incandescent when heated with CO_2 , and at a slightly higher temperature with H_2S . It does not combine with liquefied ammonia at atmospheric pressure, but in a sealed tube it forms a compound soluble in ammonia, and when heated in a current of gaseous ammonia it decomposes and forms potassium amide.—Pharm. Journ., Mar. 22, 1901; Comptes rend., 134, 18.

Sodium Bicarbonate—Value in the Treatment of Suppurating Wounds.—Teret recommends compresses saturated with a 2 to 6 per cent. solution of sodium carbonate to hasten the healing of suppurating wounds. The wound is first washed with an antiseptic solution and the con-

It must be frequently renewed and kept moist.—Pharm. Centralh., Jan. 2, 1902, 16; from Wien. Med. Presse, 1901, 1630.

Potassium Percarbonate ($K_2C_2O_6$).—*A Substitute for Hydrogen Dioxide*.—Treadwell recommends potassium percarbonate, which is now obtainable free from more than traces of foreign impurities, and containing 80 per cent. $K_2C_2O_6$ as a convenient substitute, as well as, sources of hydrogen dioxide. On adding this salt to cold dilute sulphuric acid, a solution of hydrogen dioxide is at once obtained, which is available for many purposes, for which the ordinary solution is commonly employed.—Pharm. Centralh., Jan. 2, 1902; from Chem. Ztg., 1901, 1008.

Sodium Hydride—Formation and Character.—According to Henri Moissan sodium hydride, NaH , is produced under similar conditions as potassium hydride (which see). It is obtained in the form of colorless crystals, possesses most energetic reducing properties, is soluble in the alkali metals, and is decomposed by slight traces of water. The existence of this new compound shows that the alkali metals, as well as the metals of the alkaline earths, can be made to unite with hydrogen directly, to give perfectly crystalline and definite compounds, decomposable by water, and more or less dissociable by simple elevation of temperature. These form a new series of curious compounds possessing important properties.—Chem. News, Feb. 7, 1902, 71; from Compt. rend., Jan. 13, 1902, .

Caesium—Extraction from the Mineral.—In order to get the caesium from the mineral containing the metal, C. Chabrié suggests the plan of drying the mineral at $130^\circ C$., grinding it to a fine powder, and reducing it in a platinum crucible with a hundred times its weight of pure hydrofluoric acid. The whole must be brought to boiling point and kept at that temperature until solution is nearly complete. The partial solution is then filtered, and after transformation into carbonate can be evaporated to dryness.—Chem. News, Aug. 23, 1901, 96; from Compt. rend., July 29, 1901.

Caesium—Formation of Several New Salts.—C. Chabrié has obtained and describes the sulphite, bisulphite, thiosulphite and thiosulphate of caesium.

Caesium Sulphite, $CsSO_3$, was obtained by dissolving caesium carbonate in boiling absolute alcohol, dividing the solution into two equal portions, and passing through one of these portions SO_2 for some hours, until the bisulphite formed is partially precipitated. The other half of the solution of caesium carbonate is then added and the mixture heated under a reflux condenser for three hours, after which the alcohol is distilled off and the residue dried on a porous plate *in vacuo*. Thus obtained it is a white crystalline anhydrous mass, while when prepared in the usual manner, with water, it is invariably contaminated with appreciable quantities of sulphate.

Caesium Bisulphite, obtained as indicated in the above, from alcoholic

solution, with excess of SO_2 , is in form of well-formed white crystals which are anhydrous.

Caesium Thiosulphite, $\text{Cs}_2\text{S}_2\text{O}_3$, is obtained in small crystalline needles on boiling the sulphite with flowers of sulphur ; while

Caesium Thiosulphate, $\text{Cs}_2\text{S}_2\text{O}_6$, is obtained in long transparent hexagonal tablets by the interaction of barium dithionate and caesium sulphate in molecular preparations, these crystals being anhydrous.—Pharm. Journ., Aug. 31, 1901, 293 ; from Compt. rend., 133, 295.

Ammonia—Action on Metals at High Temperatures.—G. T. Bailey and G. G. Henderson have exposed platinum, gold, silver, copper, iron, nickel, and cobalt to the action of ammonia at temperatures ranging from 400° to 900°C. , and found that in every case the physical effect of the treatment was to disintegrate the metal completely, whilst a large proportion of the ammonia was resolved into its elements. The fractures of metal which have been exposed to this action are spongy or cellular ; under the microscope the metal appears as if it had been suddenly cooled whilst in a state of active effervescence. The penetration of the ammonia molecules into the metal is remarkably quick if the conditions are favorable. The authors believe that the physical effects which result from the action of ammonia upon metals at high temperature are due to the alternate formation and dissociation of nitrides taking place between certain narrow limits of temperature, the reaction going in one direction or the other according as ammonia or hydrogen molecules preponderate in the gases which are in contact with the molecules of the metal at and below the surface. In several cases the formation of nitrides has been definitely proved. The absorption of small quantities of nitrogen by pure iron renders it hard and brittle like steel.—Pharm. Journ., Nov. 23, 1901, 575 ; from Proc. Chem. Soc., 17, 190.

Free Ammonia—Simple Method of Detection.—George Cockcroft observes that many nitrogenous organic compounds when refluxed with caustic soda give off ammonia gas, which, as it is often accompanied by other vapors (volatile spirit, &c.) which disguise the characteristic odor, is not easy to recognize in small quantity. He has devised a simple method for detecting the free ammonia, in which he employs strips of filter paper soaked in a 7 per cent. solution of CuSO_4 . One of these while still slightly moist is placed in the open end of the condenser at the beginning of the reflux distillation. The evolution of even slight traces of ammonia can then be detected by the appearance of a dark blue color on the paper ("ammoniacal" copper sulphate). This is unlikely to be vitiated by other vapors, and the method is, under these conditions, less troublesome, more delicate, and more conclusive than tests by odor, fuming with HCl , &c.—Chem. News, Nov. 29, 1901, 268.

Ammonium Compounds—Difficulties to Comply with the U. S. P. Re-

requirements.—Lyman F. Kebler observes that the presence of more than 1 per cent. of ammonium chloride in *ammonium bromide* is difficult to establish, and furthermore, bromine is allowed to contain 3 per cent. of chlorine, which, when converted into ammonium chloride, in the manufacture of ammonium bromide from bromine, amounts to more than 1 per cent. of ammonium chloride. There is very little *ammonium carbonate* that does not contain more or less empyreumatic or non-volatile matter. The requirements for *ammonium chloride* are somewhat inconsistent. A limit of iron is allowed, yet an absence of metals and non-volatile matter is required; iron is certainly a metal and is non-volatile. No *ammonium iodide* is on the market which will comply with the required limit of sulphate and the absence of more than one-half per cent. of chloride or bromide.—Amer. Drugg., March 24, 1902, 161.

Aqua Ammonia—Contamination with Arsenic.—Dr. O. Gottheil calls attention to the presence of arsenic in strong ammonia water to the amount of 0.058–0.061 per cent. The possible presence of this poisonous element is evidently ignored in the German Pharm., since hydrogen sulphide introduced *directly* into ammonia water serves to reveal copper, lead, iron and zinc, but not arsenic. It is revealed, however, if the ammonia is first treated with hydrochloric acid in excess, as recommended in Schmidt's "Pharmaceutische Chemie," and the author suggests that this provision should be incorporated among the pharmacopœial tests for the purity of ammonia water.—Pharm. Ztg., Dec. 14, 1901, 992.

Sulphamide—Preparation from Ammonium Amido-sulphite.—E. Divers and M. Ogawa have demonstrated that sulphamide is one of the products of decomposition of ammonium amidosulphite, from which it is obtainable to the amount of 10 per cent., unaccompanied by any substances that are difficult to remove. To obtain it, ammonium amidosulphite is slowly heated to 70° C., and then maintained at about that temperature, so as first to decompose the salt, and then to drive off the thionic compounds which accompany the residual sulphamide. The product is dissolved in water, when on treatment with barium hydroxide and with silver nitrate, under simple precautions necessitated by the presence of some undecomposed amidosulphite, the sulphamide is precipitated as silver salt, and from this recovered by the method recommended by Traube.—Pharm. Journ., April 12, 1902, 293; from Proc. Chem. Soc., 18, 71.

ALKALINE EARTHS.

Pure Barium—Preparation and Properties.—Pure barium has not been obtained up to the present time. Guntz, however, during certain experiments on the stability of barium amalgam, has obtained it in a pure state, and studied its properties. The barium amalgam is obtained very easily and in very considerable quantity by the electrolysis of a saturated solution of BaCl₂, the cathode being made of mercury and the anode of an alloy

LIME.

of platinum and iridium. A three per cent. amalgam of barium is obtained, from which the barium is prepared by distilling in a vacuum at a bright red heat. Barium in a metallic state is a white metal, as soft as lead. It fuses at a dull red heat, and is brittle at bright red heat. It rapidly oxidizes in the air, giving rise to a form of a condensed powder.—Chem. News, Dec. 20, 1901. Compt. rend., Nov. 25, 1901.

Barium Dioxide—Pharmacopœial Tests.—Lyman F. K. says that tests for the absence of chlorides and nitrates in barium dioxide should be given. Experience has shown that a barium dioxide containing as low as 80 per cent. of pure material will not give satisfactory results in practice. The best grades will assay from 85 to 90 per cent. These products usually work well.—Amer. Drugg., April 28, 1901.

Lime—Successful Fusion in the Electric Furnace.—H. A. H. says that, although lime is not fused by a mixture of coal gas and oxygen and acetylene at a temperature slightly above $1,800^{\circ}$, when exposed to the highest temperature of the flame becomes covered with needle-like crystals of CaO . With a mixture of hydrogen and oxygen in a Deville-Debray blowpipe, lime is also refractory, although the temperature attained is near that of fusion, and the crop of crystals of CaO is still more abundant. If, however, a mixture of exactly two volumes of hydrogen and one volume of oxygen be employed, the auto-combustion and slight fusion takes place, the lime acquiring, in places, a waxy appearance, which presents a crystalline structure on cooling. In an electric furnace with an arc of 300 ampères and 50 to 70 volts, lime not only fused and even boiled. With a stronger current, up to 1,000 ampères, the author has succeeded in melting 500 Gm. of lime in the cavity of the furnace itself composed of quicklime. After being fused for ten minutes, the surface of the cover of the crucible and the portions of unmelted lime were covered with a plentiful crop of crystals, some of which are rectangular transparent parallelopipeds, others in fine needles, some opaque and sometimes transparent, none of which, however, are soluble in water, but which, when mounted in Canada balsam and kept for some time, break up, and the fragments thus formed are strongly active in the spectrum of light. Crystalline lime would therefore appear to be dimorphic. These crystals have a density of 3.4, although the pure lime from which they were prepared has the sp. gr. 3.3. When graphite in excess is brought into contact with fused lime, calcium carbide and carbon monoxide are formed, while if the lime be in excess, the carbide formed is reduced, metallic calcium is volatilized and a further portion of carbon is evolved. Silicium is oxidized into silica, and forms a basic silicate on contact be prolonged; spheres of silicium, which have a marked conchoidal fracture when cold, are obtained. Boron melts in fusion, and forms a borate; if the experiment is brief, the melted masses

enveloped with crystals of calcium boride, CaB_6 . These are covered with well formed crystals of basic calcium borate. Titanium is rapidly oxidized, and the lime is partially converted into basic calcium titanate, soluble in dilute acetic acid. Chromium is converted into well-formed crystals of the double oxide $\text{Cr}_2\text{O}_3\cdot 4\text{CaO}$. Manganese, nickel, iron and cobalt are all rapidly oxidized by melted lime, platinum is melted and diffused in the liquid, sometimes separating in large crystals on cooling. During the fusion considerable quantities of the metal are volatilized, being given off through small tubular fumeroles of molten lime. The same phenomenon was observed with iron, nickel, cobalt, and especially with manganese.—Pharm. Journ., May 24, 1902, 430; from Compt. rend., 134, 136.

Strontium Hydride—Preparation and Properties.—Henry Gautier has succeeded in obtaining strontium hydride, SrH_2 , by heating an alloy of metallic cadmium and strontium, containing 43 per cent. of Sr. in a boat of compressed magnesia, in a current of hydrogen. It forms a white solid, which is readily decomposed by water, liberating hydrogen, and forming strontia. In its general behavior it resembles CaH_2 , previously described. In the cold it is not attacked by chlorine, but on gently warming it combines with that gas, forming SrCl_2 , and liberating HCl . It is unattacked by liquid bromine even on boiling, but at a dull red heat it combines with the vapor of bromine, with incandescence. Iodine and sulphur combine with it at the same temperature. Oxygen, especially when combined with metals, as in the chlorates or perchlorates, combines with the hydride with explosive violence. With iodates the reaction is less violent. Chromates are rapidly reduced. When a mixture of powdered SrH_2 and $\text{K}_2\text{Cr}_2\text{O}_7$ is ignited the mixture becomes incandescent, and the bright green residue consists of a mixture of strontia and chromium sesquioxide. Metallic oxides are also energetically reduced by strontium hydride.—Pharm. Journ., Mar. 22, 1902, 233; from Comptes rend., 134, 100.

Strontium Carbonate—Preparation from Celestin.—The most abundant strontium mineral, celestin (strontium sulphate), is with difficulty converted into strontium carbonate, from which strontium oxide, used in large quantities for removing the sugar from molasses, is prepared by combustion at a white heat. W. H. Bressler has now determined that in the presence of carbon dioxide and under high pressure complete conversion of strontium sulphate into carbonate may be rapidly effected by means of sodium carbonate, the reaction occurring according to the formula: $\text{SrSO}_4 + \text{Na}_2\text{CO}_3 = \text{SrCO}_3 + \text{Na}_2\text{SO}_4$. The finely-powdered celestin is mixed with water, an equivalent of sodium carbonate or bicarbonate is added, and then carbonic acid and steam are admitted under such conditions that a pressure of about eight atmospheres and temperature of 175°C . shall be maintained for a short period.—Phar. Ztg., July 31, 1901, 608; from. Techn. Rdsch.

EARTHS.

Aluminum—Successful Production of an Alloy with Nickel.—An alloy of aluminum and nickel has been successfully produced in the “Minkin” metal works by the use of a furnace of special construction, with a combustion-loss of only 1 per cent. The new alloy, called

Nickelalumin, possesses valuable properties. It is only a little heavier than aluminum, its specific gravity being 2.8, possesses a ductility of 12 to 14 kg. per square millimeter, and is easily worked into sheets and drawn out into wire. It is, moreover, characterized by great resistance to acids, is not affected by air, does not oxidize or rust, assumes a superior polish and silvery appearance, and may with the aid of glycerin be hammered, turned, pressed and edged with great facility. It is true that these properties are also claimed for the aluminum-magnesium alloy called

Magnalium (see Proceedings, 1900); but it is stated that magnalium utensils in time become brittle, and it therefore remains to be seen which of the two alloys will retain its integral character for the longest time.—Pharm. Ztg., Dec. 28, 1901, 1034; from Techn. Rundschau.

Alumina—Reduction not Due to Carbon Alone.—S. A. Tucker and H. R. Moody have investigated the reduction of aluminum oxide, and from a series of experiments conclude that it is not reduced by carbon alone to any appreciable extent, even when exposed to the very high temperature of the electric arc. It is, however, reduced to the metallic state by the calcium carbide (produced during the process from lime and the excess of carbon), according to the equation: $\text{Al}_2\text{O}_3 + \text{CaC}_2 = \text{Al} + 2\text{CO} + \text{CaO}$. Calcium carbide being a body exothermic on decomposition yields up a large number of calories, and thus raises the temperature to a sufficiently high degree. A high ampèreage and voltage should be used for not more than fifteen minutes, since a longer time results in the conversion of some of the reduced metal into aluminum carbide.—Pharm. Journ., Feb. 1, 1902, 82; from Journ. Soc. Ind., 20, 970.

Aluminum Chloride—Compounds with the Alkali Chlorides.—E. Baud has investigated the mixed compounds of aluminum chloride and alkali chlorides— $\text{Al}_2\text{Cl}_6 \cdot 3\text{NaCl}$ and $\text{Al}_2\text{Cl}_6 \cdot 3\text{KCl}$; also, very probably, the chlorated cryoliths $\text{Al}_2\text{Cl}_6 \cdot 6\text{NaCl}$ and $\text{Al}_2\text{Cl}_6 \cdot 6\text{KCl}$. Even these latter bodies do not apparently represent the limiting compounds of Al_2Cl_6 with the alkaline chlorides, but it is not difficult to establish thermometrically the existence and the exact composition of the higher ones, on account of the very small proportion of heat evolved during the fixation of the last molecules of the alkaline chlorides.—Chem. News, Dec. 20, 1901, 304; from Compt. rend., Nov. 25, 1901.

Aluminum Sulphate—Contamination with Iron.—Referring to the stringent test of the Phar. Germ., IV, for the presence of iron in aluminum sulphate, K. Dieterich states that his firm has been unable to find a salt in

commerce that is completely free from iron. He calls attention also to the inconsistency of that standard in not giving a test for the presence of iron in *Liquor Aluminii Acetici*, which is made from the sulphate.—*Pharm. Centralh.*, Aug. 1, 1901, 464 ; from *Helf. Annal.*, 1901.

Crystalline Magnesium Aluminate—Artificial Preparation and Production of Various Tints.—Emile Dufau has obtained crystalline magnesium aluminate, MgAlO_4 , in the form of sharply defined octahedra, by heating together a previously calcined mixture of 4 parts of alumina and 2 parts of magnesia in the electric furnace with an arc of 900 ampères and 45 volts. The crystals are readily separated by treating the fused mass with boiling nitric acid and throwing the insoluble residue of mixed carbon and magnesium aluminate into methyl iodide when, from its greater density the latter falls to the bottom of the liquid. The crystals may be obtained tinted various colors by the addition of one or two per cent. of metallic oxides, such as those of iron, nickel, cobalt, chromium, or copper to the mixture before fusion. A rose-brown tint is thus given by copper dioxide which has not before been met with in natural spinelle.—*Pharm. Journ.*, July 27, 1901, 93 ; from *Journ. de Pharm. Chim.* (6), 14, 25.

Pure Cerium Oxide—Preparation and Properties.—Jean Sterbas prepared pure cerium oxide by a modification of Wyronboff and Verneuil's method, the operation being much accelerated by using electrolysis as the oxidizing agent. When perfectly pure, cerium oxide can have a decided color, but when prepared with exclusion of nitrogen during the process it becomes snow white. He furthermore finds that the action of hydrogen results in incomplete reduction and formation of Ce_2O_3 , and that zinc also reduces the oxide CeO_2 . By a method of crystallization at different temperatures, the author obtained cerium oxide in cubes or cubo-octohedrons, isotropic, colorless or transparent, whose density varies according to the temperature at which the crystals are formed.—*Chem. News*, Aug. 16 and 23, 1901, 84 and 96 ; from *Compt. rend.*, July 22 and 29, 1901.

Cerium Salts—Contamination with Lanthanum and Didymium Salts.—See *Cerium Oxalate*, under "Organic Acids."

Beryllium—Formation and Character of Volatile Salts.—According to G. Urbain and H. Lacombe, an amorphous gummy mass is obtained on dissolving beryllium oxide in dilute acetic acid, and this yields crystalline basic beryllium acetate, having the formula $(\text{CH}_3\text{CO}_2)_6\text{Be}_4\text{O}$. It forms crystalline needles, melting at 283° – 284° C., and boiling, undecomposed, at 330° – 331° . When dissolved in absolute alcohol and treated with alcoholic KOH no precipitate is thrown down, but on the addition of a trace of water an immediate precipitation takes place, the phenomenon being a remarkable instance of ionization. The salt is very stable in an acid solution ; when dissolved in acetic acid, saturated with HCl, and heated to 150° C. it remains quite unaltered.—*Pharm. Journ.*, May 31, 1902, 449 ; from *Comptes rend.*, 133, 874.

Neodymium Chloride—Characters.—Camille Matignon has further examined and studied the characters of neodymium chloride, as obtained by crystallization from aqueous solutions, it occurs in large rose-colored clinorhombic, deliquescent crystals, having the formula $\text{NdCl}_3 \cdot 6\text{H}_2\text{O}$. The solubility in water at 13°C . is $2.462 : 1$. The specific gravity of the crystals 2.282 at 16.5°C . with water at 4°C . It dissolves in water with generation of heat. The saturated solution at 13°C . has the specific gravity 1.741 . The salt cannot be dried by means of heat in the ordinary way, since it is converted into oxychloride, but if heated in a current of dry gaseous HCl it slowly loses five molecules of water at 105°C . The resulting $\text{NdCl}_3 \cdot \text{H}_2\text{O}$ does not give up its last molecule of H_2O under 130°C . in the current of HCl ; it is necessary to heat the salt to 160° to obtain pure anhydrous NdCl_3 . The anhydrous chloride is better prepared by first converting the sulphate into sulphide by the aid of hydrogen sulphide, then the sulphide into chloride by heating in a current of gaseous HCl . As thus obtained NdCl_3 forms a rose-colored powder which melts at a red heat, and forms a transparent rose-colored crystalline mass on cooling. It is extremely deliquescent, but not sensibly volatile at 1000° to 1100°C . Thrown upon water, it dissolves with the evolution of much heat, hissing like red-hot iron. It is entirely soluble in absolute alcohol. Calorimetric experiments confirm the trivalency of neodymium as shown in the formula NdCl_3 .—Pharm. Journ., Aug. 31, 1901, 293; from Comptes rend., 133, 289.

Monazite—Analysis of a Sample from New Granada.—Nicholas J. Bluman has made an analytical examination of a sample of monazite from New Granada: Cerium oxide, Ce_2O_3 , 25.02; lanthanum oxide, La_2O_3 , 22.41; thorium oxide, ThO_2 , 18.00; manganese oxide, MnO , 1.21; calcium oxide, CaO , 2.13; tin oxide, SnO_2 , 3.00; phosphoric acid, P_2O_5 , 28.23 per cent.; with traces of iron, zinc and sulphur. The sp. gr. of the mineral is 6.001; hardness, 5; color, reddish-brown.—Chem. News, Oct. 11, 1901, 175.

Radium—Chemical Action of its Rays.—Berthelot has made a series of experiments with a specimen of radium obtained from Mr. Curie, in which he compared certain specific chemical reactions, which are caused by light and electricity, to those provoked by radium. These experiments were tedious because of the very small quantities of radium supplied and the necessity of working in glass envelopes. These latter absorb part of the rays, and, in certain cases, probably the most efficient portion; and they are also unsatisfactory on account of the long time necessary to accomplish these phenomena. The experiments tried were: (1) The action of radium on iodic acid (I_2O_5) in darkness.—After nine days the acid begins to be tinted with violet, and after some time iodine vapor is apparent. (2) Monohydrated nitric acid (HNO_3).—At the end of two days the acid begins to discolor, whilst if kept for three years in total darkness it is

still colorless. (3) A solution of octahedral sulphur in carbon disulphide, when exposed to light, deposits insoluble sulphur in virtue of an exothermic reaction; a tube of radium immersed in the solution in darkness produces no such effect. (4) Gaseous acetylene is very sensitive to the action of the electric current, an exothermic polymerization taking place. This gas is not affected by either solar light or radium. (5). The slow oxidation of oxalic acid which takes place in presence of light, also takes place in the presence of radium.—Chem. News, Nov. 22, 1901, 250; from Compt. rend., Oct. 28, 1901.

Radium—Effect of its Rays on Phosphorus.—Henry Becquerel describes some effects of the rays emitted by active radium, which have not previously been noted. Among others they have the property of converting ordinary phosphorus into red amorphous phosphorus. Even when the radiant matter is surrounded by a screen of metallic aluminum, so as to cut off the light emitted by the phosphorescence, the phosphorus in contact with the radium rays becomes converted into the amorphous state. The same rays brought about the reduction of HgCl_2 to HgCl in the presence of oxalic acid, acting in a similar manner to ordinary light rays. These rays are also found to destroy the vitality of seeds. Mustard and cress seeds exposed to their action for a week or more, refused subsequently to germinate, but were not sensibly affected by an exposure of twenty-four hours.—Pharm. Journ., Dec. 7, 1901, 639; from Compt. rend., 133, 709.

MANGANESE.

Soluble Manganese and Iron Compounds—Preparation and Properties.—Frederick B. Power describes the experiments made with the object of supplying processes for preparing several medicinal salts of manganese combined with iron that possess permanence and solubility. Incidentally he also reviews the characters of the various manganese citrates that have heretofore been prepared and supplied. These appear to be of two kinds, both occurring in the form of a white powder, sparingly soluble in cold water—the one of German origin being evidently an acid salt, containing 17.8 per cent. of manganese, the other of English manufacture, containing 23.58 per cent. Mn., and evidently corresponding to one of the salts first prepared by Kämmerer (1868), as recorded in Beilstein's *Handbuch der Organischen Chemie*. This has the composition $\text{Mn}_2(\text{C}_6\text{H}_5\text{O}_7)_2 \cdot 9\text{H}_2\text{O}$, and was selected by Dr. Power as the basis for the preparation of

Soluble Manganese Citrate, which was prepared as follows: Manganese sulphate, cryst., 100 grams; sodium carbonate, cryst., 140 grams; citric acid, 62.8 grams. The manganese sulphate and sodium carbonate are dissolved separately in a convenient quantity of water, with the aid of heat, and filtered. To the solution of manganese sulphate the sodium carbonate is added gradually, with constant stirring, and the precipitate, after being

allowed to subside, is washed repeatedly by affusion and decantation with water until the washings afford not more than a slight reaction for sulphate. The moist manganese carbonate is then brought into a porcelain dish with a little water, the citric acid added, and the mixture heated on a water-bath for about half an hour, with occasional stirring. If the dry salt is desired, the product, which should form a somewhat thick mixture, is brought on a filter, washed with a little water, and dried at a gentle heat. It is thus obtained as a white crystalline powder, and the yield of the salt on a small scale is very nearly the theoretical. To the simple manganese citrate obtained from the above quantities, while still moist and contained in a porcelain dish, 105 grams of crystallized sodium citrate are added, and the mixture heated on a water-bath until complete solution is effected. The liquid is then diluted sufficiently to filter readily, and at once spread on glass plates, so that on drying it may be obtained in the form of scales. The salt in the state of solution oxidizes readily and becomes brown, but in the dry state it is quite permanent when protected from the light. The salt forms handsome pearly scales, which are very freely soluble in water. Like other similar scale salts, it cannot be considered a definite chemical compound, and is subject to slight variations in composition according to the care exercised in its preparation, the thickness of the scales, and the temperature at which they are dried. Several determinations of the manganese have shown the latter to vary within the limits of about 12 to 13 per cent.

Soluble Iron and Manganese Citrate is prepared with the aid of the *simple* manganese citrate obtained under the conditions and in the quantities of the above process (using 100 Gm. of crystallized manganese sulphate). To the moist manganese citrate, contained in a porcelain capsule, and representing 24.66 Gm. of manganese, a calculated quantity of solution of ferric citrate is added, and the mixture heated on a water-bath until complete solution is effected. The amount of iron required for this purpose is 49.3 Gm., or double that of the manganese. If the iron citrate solution of the U. S. P. is employed, it is first assayed for its iron content by the iodometric method—this being the most accurate and convenient—and if, for example, this is found to contain 8 per cent. of Fe, then 616.5 Gm. of the iron solution will be necessary. When solution has been effected, the liquid is filtered, evaporated to the consistence of syrup, and spread on plates of glass, so that on drying it may be obtained in the form of scales. It forms handsome yellowish-brown scales, which are readily soluble in water, especially when slightly warmed, affording a clear, yellowish solution. The solution is not precipitated by ammonia, which produces a deep red color; with potassium ferrocyanide it affords a light blue precipitate, changing to deep blue on the addition of a mineral acid.

Soluble Iron and Manganese Phosphate is calculated to contain the same relative proportions of iron and manganese as the preceding, and its

method of preparation is precisely analogous. Like the so-called soluble phosphate of iron of the U. S. Pharmacopœia, it is really a citro-phosphate. It was prepared in the following manner: Manganese sulphate, cryst., 100 grams; sodium phosphate, cryst., 240 grams; solution of ferric citrate (containing 8 per cent. Fe), 616.5 grams, or a corresponding amount of solution of other percentage strength. The salts are dissolved separately in a sufficient amount of water with the aid of heat and filtered. To the solution of manganese sulphate, while warm, is added the warm solution of sodium phosphate. The precipitate of manganese phosphate is allowed to subside, and washed by affusion and decantation with water until the washings afford not more than a very slight reaction for sulphate. The precipitate, while still moist, is then brought into a porcelain dish, the solution of ferric citrate added, and the mixture heated on a water-bath until complete solution is effected. It is then filtered and the liquid spread on glass to scale in the usual manner. The salt should be kept protected from the light. It forms handsome, greenish-yellow scales, which are slowly soluble in cold, but readily in warm water, and the solution has the general properties described under iron and manganese citrate. Like the latter, it ordinarily contains about 14 per cent. of iron and 7 per cent. of manganese.—Trans. Brit. Pharm. Conf., 1901, 458–465.

Barium Manganate and Manganite—Conditions of Formation, Composition, &c.—G. Kassner and H. Kellner have investigated and studied the conditions under which barium manganate and manganite are formed by the methods recently communicated by Adolf Jolles. The various steps necessary for this purpose are: (1) the preparation of potassium manganate from potassium permanganate by the action of potassium hydroxide (in solution) and subsequent heating of the dried mixture in a muffle; (2) the preparation of barium manganate by double decomposition between the potassium manganate obtained and barium chloride under certain precautions; and (3), the reduction of the barium manganate to barium manganite, for which purpose Jolles used potassium ferrocyanide. The results of the investigations are briefly as follows: (1) The production of potassium manganate according to the equation given by Jolles, $2\text{KMnO}_4 + 2\text{KOH} = \text{H}_2\text{O} + 2\text{K}_2\text{MnO}_4 + \text{O}$, does not result smoothly and satisfactorily. It is necessary to use about $1\frac{1}{2}$ to 2 times as much KOH as is contemplated by the equation, to prevent decomposition during solution. (2) In the composition of the precipitated barium manganate a content of barium permanganate, formed during the process, must be taken into account, besides unavoidable contamination with barium carbonate and manganese oxides. (3) It is not confirmed by the authors' results that the molecule of barium manganate, BaMnO_4 , is chemically united to one molecule of H_2O . The air-dry product contains only 2.97 per cent. of water, whereas the formula $\text{BaMnO}_4 \cdot \text{H}_2\text{O}$ requires 6.57 per cent. of water. (4) The reduction of barium manganate to man-

ganite is preferably effected by hydrogen dioxide. Potassium ferrocyanide, iron is liable to be introduced while during the washing the dissociation of the oxide and manganese oxide is more pronounced. The formula of barium manganite according to the formula of appears to be correct. When completely air dry (attained 6.8 per cent. of water, the above formula required). Arch. d. Pharm., 239, Nos. 6 & 7 (Aug. 18 and Sept. 1890).

Potassium Permanganate—Improved Process of Preparation.—A process for the complete conversion of manganate into permanganate has been patented in Germany. The crude manganate is prepared by way by melting manganese dioxide and alkali under pressure, exhausted with water and a current of *ozonized* air, and then through the alkaline solution. The conversion of manganate into permanganate is complete and rapid, whereas when manganate is thus introduced the formation of permanganate is incomplete. —Pharm. Ztg., 1901, 517.

Potassium Permanganate—Color Reaction in Solution with Organic Substances.—Henrik Enell calls attention to the fact that under certain prescribed conditions a large number of organic substances give a violet color reaction with permanganate and sulphuric acid, similar to that produced by the same reagent on *strychnine*. ("Organic Bases.")

IRON.

Ferrum Redactum—Presence and Estimation of Arsenic.—Peck having some years ago noticed the contamination of reduced iron with arsenic, has now subjected sixteen different samples of determining the extent of its presence. Finding that many samples of reduced iron contained sulphide, which interferes with ordinary methods for determining the arsenic, he has modified the test of the Pharm. Germ., IV., for detection of arsenic. He found that this, slightly modified, was available for the estimation of the amount present. The test of the Pharm. Germ. is simply intended to determine the presence or absence of arsenic, and is carried out as follows: "A mixture of 0.2 gram of reduced iron and 0.2 gram of potassium chlorate must be put into a large test tube, and with chloric acid poured over it. After the reaction is ended, the solution until the free chlorine is driven off, and the solution then treated with 1 Cc. of the filtrate with 3 Cc. of solution of stannous chloride. The stannous chloride was found useful for this reaction; and therefore resorted to the solution of stannous chloride of which is prepared as follows: Crystallized tin chlor

chloric acid, 1 part ; stirred to a paste and then completely saturated with dry hydrochloric acid gas. The solution is then filtered through asbestos, and is described as a pale yellowish, strong-smelling liquid, with a specific gravity of at least 1.900.

If this test was applied direct to solutions of As_2O_3 , it was found that a definite coloration was obtained with as little as 0.1 Cc. of a 0.1 per cent. solution ($= 1 : 100,000$), proving it to be extremely delicate, and that with larger quantities correspondingly deeper, but definite colors could be obtained—these colors ranging from a light reddish-brown through dark brown to black. A chromatic series may thus be established for comparison, with the colors produced when 0.2 gram of the reduced iron is subjected to the test of the Pharm. Germ., this being modified only to the extent of making up the solution to 2 Cc. after driving off the chlorine and before filtering. One Cc. of this filtrate, representing 0.1 Gm. of the reduced iron, is then placed in a small evaporating dish. 3 Cc. of the solution of stannous chloride is added, and the color compared with the colors of the standard. The author found three of the samples to be arsenic-free and (altogether) ten samples containing only a sufficient quantity to give a very slight coloration. Two gave distinct colorations, from which approximate determinations could be made, and four gave reddish-brown colorations from which corresponding amounts could be calculated—these being approximately over 0.1 per cent., and the samples consequently unsuitable for administration. On the basis of his observations the author suggests that the limit of arsenical contamination in Ferrum Redactum, P. B., should be fixed on these lines: (1) That 0.2 Gm. be taken and treated as described. (2) That the solution after driving off the chlorine be made up to 2 Cc. with HCl , and then filtered, of which 1 Cc. corresponding to 0.1 of the sample taken should be treated with 3 Cc. of the SnCl_2 (sp. gr. 1.900) solution. (3) That no light brown coloration should take place within one hour (corresponding approximately to 0.1 per cent. of arsenium). In the table accompanying the paper it is noticed that the dark grey and black samples of ferrum redactum are those which contain most arsenic.—Trans. Brit. Pharm. Conf., 1901, 452-458.

Reduced Iron—Modification of G. P. Test.—O. Schmatolla calls attention to possible conditions of inaccuracy in the determination of metallic iron by the official (G. P.) method in the reduced iron of that standard. The presence of potassium iodide is not only unnecessary but it is liable to indicate a higher percentage of free iodine after the reaction of the added iodine with the iron. Furthermore, the quantity of iodine is barely sufficient, and should be slightly increased. Of minor importance, although exerting some influence on the accuracy of the test, is the amount of water to be employed. The author proposes the following modification: Place 0.3 Gm. of the sample into a thin-walled, glass-stop-

constantly but keeping it in the cold water bath until the iodine is completely dissolved. It may then be removed from the water-bath and allowed to stand, under occasional agitation, for half an hour, when it may at once be titrated with $\frac{N}{10}$ sodium thiosulphate solution. Having employed chemically pure iodine under suitable precautions that the exact amount (1.6 Gm.) shall be introduced into the flask, not more than 28.5 Cc. of the thiosulphate solution should be required for the complete combination of the free iodine—this quantity indicating 91 per cent. of metallic iron in the sample, which is the lowest official limit.—Pharm. Ztg., Oct. 9, 1901, 810.

Iron—Precaution in Applying the Thiocyanate Test.—F. A. Upsher Smith finds that the thiocyanate test for iron, which directs to boil the substance with a few drops of nitric acid, in order to raise the iron to the ferric state, and then add a solution of ammonium thiocyanate, is liable to mislead, because nitric acid alone gives a reddish tint with ammonium thiocyanate, due to the oxides of nitrogen that are given off. Boiling the solution disperses these and leaves a green solution. If iron is present the red color remains, though it may be lighter in color. Dilute hydrochloric acid also strikes a reddish tint with ammonium thiocyanate. The remedy consists in just neutralizing the solution with ammonia after boiling with nitric acid.—Pharm. Journ., Feb. 22, 1902, 143.

NICKEL AND COBALT.

Nickel—Qualitative Determination of Small Quantities.—H. Ditz has found the following method for the detection of small quantities of nickel to be useful: The neutral solution is placed into a flask in a quantity not exceeding one-third of its capacity because of the violence of the reaction, potassium chromate is added in slight excess; the mixture is heated, Rochelle Salt is added, and the heat increased to brisk ebullition for several minutes after solution has been effected. The solution is allowed to cool for some time and diluted with water to destroy the intensity of the color. In the presence of nickel a brown flocculent precipitate of nickel chromate is deposited after a few minutes, which is plainly visible even when only small in quantity. It may contain traces of cobalt, however, and it therefore remains to be determined whether the method is available for estimating nickel quantitatively.—Pharm. Ztg., Nov. 20, 1901, 927; from Ztschr., f. angew. Chem., 1901, 894.

Cobalt Silicide, SiCo—A New Compound.—Paul Lebeau describes a new cobalt silicide, SiCo, differing from the cobalt silicide described by Vigouroux, which had the composition SiCo₂. It was obtained by heating together a mixture of copper silicide and cobalt filings in a carbon crucible in the electric furnace. A hard button was obtained, which, when treated

alternately with nitric acid and soda solution, left insoluble, fine crystals of cobalt silicide, SiCo . It forms very bright prismatic crystals, having the density at 20°C ., 6.30; it is not very hard, only slightly scratching glass. It is insoluble in HNO_3 and in H_2SO_4 , is but slowly dissolved in nitro-hydrochloric acid, but more quickly in HCl . It is only slightly oxidized in the vapor of water at 1200°C ., and, at high temperatures, ammonia gas reacts on it with fixation of nitrogen. It melts in a current of hydrogen at about 444°C ., forming a mass with a fine metallic lustre and a crystalline fracture.—Pharm. Journ., July 21, 1901, 61; from Bull. Soc. Chim., 25, 538.

CHROMIUM.

Chromium Nitride—Formation and Properties.—J. Ferée finds that if pyrophorous chromium, obtained by distilling its amalgam below 350°C ., is gently heated in a weak current of hydrogen, the temperature increases spontaneously to a white heat, and chromium nitride, NCr , is produced. The nitride so produced yields ammonia on heating to redness, and is insoluble in hydrochloric and in nitric acid by themselves, as well as in aqua regia. Chromium nitride may also be produced by the action of ammonia on pyrophorous chromium, as also by that of nitric oxide. The product of the latter reaction contains, however, green chromium oxide in admixture.—Pharm. Ztg., Nov. 20, 1901, 927; from Bull. Soc. Chim., 1901, 608.

Chromous Oxide—Formation and Characters.—According to J. Férée, when chromium amalgam is exposed to dry air it becomes covered with a black powder, which is a new oxide of chromium, CrO . It is not very stable; when triturated in a mortar it becomes incandescent, and is converted into chromic oxide. If heated, the same reaction at once takes place, and incandescence at one point spreads at once through the mass. It is insoluble in dilute sulphuric and nitric acids; the blue solution obtained with hydrochloric acid is at once turned green by the addition of nitric acid.—Pharm. Journ., Aug. 31, 1901, 293; from Bull. Soc. Chim. [3], 25, 619.

Chromic Acid—Unsatisfactory Commercial Character.—Lyman F. Kebler calls attention to the unsatisfactory quality of commercial chromic acid. This is supplied often containing as much as 60 per cent. of sodium acid sulphate, the presence of which is due to the practice of manufacturers of mixing molecular portions of sodium bichromate, dissolved in water and sulphuric acid, and then simply drying the product. There is so much variation in the physical appearance of the best grades of chromic acid, that it is easy to be deceived. The only safe plan is to estimate the actual content of chromic acid. A short and rapid method is the one below described.—Amer. Journ. Pharm., Jan., 1902, 13.

Chromic Acid—Revision of Pharmacopœial Requirements of Purity.—Lyman F. Kebler observes that to require a complete absence of sulphuric

acid in chromic acid is too rigid ; a limit should be set, and tests should be added to detect the presence of nitric acid or nitrates. It is very desirable to establish a percentage of purity, for it is well known that this chemical, as generally supplied, is very impure, and contains an excess of moisture. To determine the per cent. of chromic anhydride, Mr. Kebler has used the following method with considerable success : Dissolve about 1 Gm. (accurately weighed) in enough water to make exactly 100 Cc. ; of this solution transfer 20 Cc. to an evaporating dish containing 75 Cc. of distilled water ; add 15 Cc. of 10 per cent. sulphuric acid, also 2 Gm. of potassium iodide, mix well and allow the mixture to stand five minutes. Then add decinormal sodium thiosulphate solution until a distinct blue color, without yellow cast, results ; or the end reaction can be determined by means of starch solution. Each Cc. of thiosulphate consumed represents 0.003329 Gm. of chromic anhydride.—Amer. Drugg., Dec. 9, 1901, 344.

Chromic Acid — Sensitive Color Reaction with Diphenylcarbazia (Phenylhydrazine), which see under "Organic Chemistry."

Sodium Chromate—Formation of a New Hydrate.—Heretofore the only hydrates of sodium chromate that have been described were $\text{Na}_2\text{CrO}_4 + 4\text{H}_2\text{O}$ and $\text{Na}_2\text{CrO}_4 + 10\text{H}_2\text{O}$; but H. Salkowski now describes a third hydrate, which was produced accidentally on cooling a saturated solution of the tetrahydrate, $\text{Na}_2\text{CrO}_4 + 6\text{H}_2\text{O}$. It occurs in the form of deep yellow, tabular, triclinic crystals, and is easily produced in quantities if a crystal of the hexahydrate is placed into a concentrated solution of the tetrahydrate at 18° – 20° C. When heated to 26° – 27° C., the hexahydrate is partially liquefied and the tetrahydrate reproduced.—Pharm. Ztg., Nov. 20, 1901, 926 ; from Ber. d. D. Chem. Ges., 34, 1947.

COPPER.

Copper—Belting Rivets a Source in Powdered Drugs and Chemicals.—The periodical observations of the unaccountable presence of traces of copper in various powdered drugs and chemicals has induced E. H. Gane to investigate a case that has given rise to considerable trouble and annoyance. In this case—ammonium carbonate—the whole substance was proven to be free from copper, and all copper utensils or other sources of copper contamination had been supposedly eliminated ; but on examination of the powder, it again contained traces of copper. Further investigation proved this to be derived from the copper rivets in the driving belt of the mill. When these were eliminated, the powder proved to be free from copper.—Am. J. Pharm., June, 1902, 289 ; from Journ. Soc. Chem. Ind., Feb., 1902.

Cupric Hydrate—Formation of Interesting Double Salts.—By the action of tetra-cupric hydrate on metallic solutions, H. Mialhe has obtained a series of interesting double salts, the formation of which he describes as

follows: By allowing a moderately concentrated solution of cadmium sulphate to remain in contact with the cupric hydrate for several months in the cold, a bluish-green powder of hexagonal tablets of the orthorhombic prismatic series was obtained, which had the composition $2\text{CdSO}_4 \cdot 3\text{CuO} + 12\text{H}_2\text{O}$. If the mixture be heated on the water-bath to $25-30^\circ \text{C}$., the same salt is formed in a few days. By boiling, a green precipitate of hexagonal tabular crystals is formed in a few minutes. These have the composition $2\text{CdSO}_4 \cdot 3\text{CuO} + 10\text{H}_2\text{O}$. With nickel sulphate, under like conditions in the cold or at 30°C ., the compound $2\text{NiSO}_4 \cdot 3\text{CuO} + 12\text{H}_2\text{O}$ was obtained as quadrangular green scales, while on boiling, $2\text{NiSO}_4 \cdot 3\text{CuO} \cdot 10\text{H}_2\text{O}$, separated in rhomboid lamellæ. Cobalt gives a double salt containing more copper when prepared at the lower temperature, the maroon precipitate, consisting of quadratic crystals, often grouped in a spherical form, having the constitution $3\text{CoSO}_4 \cdot 5\text{CuO} \cdot 16\text{H}_2\text{O}$. On boiling, however, the birefringent hexagonal tables formed have the formula $2\text{CoSO}_4 \cdot 3\text{CuO} + 10\text{H}_2\text{O}$ analogous to the compounds of cadmium and nickel. With zinc, the composition of the double salts was found to vary with the strength of the solutions employed. When only one-sixth of a molecular weight of the zinc salt was present in the liter, the bluish-green birefringent lamellæ had the composition $\text{ZnSO}_4 \cdot 3\text{CuO} + 5\text{H}_2\text{O}$. With from 1 to 3 molecules of zinc sulphate, quadratic prisms of either $2\text{ZnSO}_4 \cdot 3\text{CuO} + 12\text{H}_2\text{O}$, or $2\text{CuSO}_4 \cdot 3\text{ZnO} + 12\text{H}_2\text{O}$ were obtained. With a concentration of 1 to $\frac{1}{4}$ of a molecular weight of zinc sulphate, the basic salt $\text{ZnSO}_4 \cdot 2\text{CuO} \cdot 5\text{H}_2\text{O}$ or $2\text{ZnSO}_4 \cdot 3\text{CuO} \cdot 12\text{H}_2\text{O}$ resulted. With $\frac{1}{4}$ to $\frac{1}{6}$ of a molecular weight, the resulting compound had the formula $\text{ZnSO}_4 \cdot 3\text{CuO} \cdot 5\text{H}_2\text{O}$, or a mixture of this with the compound $2\text{ZnSO}_4 \cdot 3\text{CuO} \cdot 12\text{H}_2\text{O}$. This last salt is invariably obtained when mixtures of any strength are boiled together.—Pharm. Journ., March 29, 1902, 253; from Comptes rend., 134, 42.

Cupric Ammonio-Sulphate—Formation of Large Crystals.—H. De-fournel obtains cupric ammonio-sulphate in fine, large, well-formed crystals by the following process: A hot, saturated aqueous solution of cupric sulphate is prepared, which is cooled to 50°C ., then further cooled in a stream of cold water, to produce a rapid crystallization of small crystals. The solution is then filtered, and treated with excess of ammonia, until it smells distinctly ammoniacal. It is then placed in a dialyzing apparatus, the outer vessel of which is charged with alcohol, 90 per cent., containing 5 per cent. of ammonia. The whole is covered with a sheet of greased glass to prevent the volatilization of the ammonia and alcohol. After four days the ammoniated alcohol is syphoned off, and replaced by a fresh portion of the same solution, and again left for a period of four days. On repeating the process, a crop of fine crystals will be obtained on the under surface of the septum.—Pharm. Journ., Dec. 28, 1901, 715; from Rép. de Pharm., 13, 468.

LEAD.

URANIUM.

Uranium—Radio-Activity.—F. Soddy states that the which UrX, prepared by Crookes' original method, has been inactive to a sensitive photographic film, but its activity to meter is very nearly normal, while UrX is intensely active graphic plate, and almost inactive to the electrometer under circumstances. This is due to the dual character of uranium. The α - or easily absorbed radiation being without appreciable effect on the photographic film, and contributing by far the major part of the ionization effect observed by the electrometer. The β - radiation, on the other hand, causes the whole of the photographic plate to be blackened, but being little absorbed by gases, and constituting but a small part of the total radiation, its ionization effect cannot be well observed by the electrometer without special arrangements. UrX possesses a small amount of the α -radiation, the latter being completely retained by the uranium. The β - is wholly deviable in the magnetic field, though not at all, the conclusion of Becquerel that the whole of the radiation is deviable in the magnetic field being thus explained. The discovery of Becquerel that inactive uranium recovers its activity points to a continuous production of UrX by the uranium, and of fact, continuous production can be observed by means of the electrometer in uranium originally freed from UrX after three days. As in the case of thorium (which see) the α -radiation of uranium constitutes a small activity comprising only non-deviable radiation, and it has not been found possible to remove it by chemical means. Experiment shows that if it is a secondary radiation caused by UrX, it must take on the same decay to half its value after the exciting cause has been removed, but it seems, therefore, more probable that it is caused by a secondary uranium matter, produced from the uranium by the same chemical process as UrX.—Pharm. Journ., May 31, 1902, 450; from Proc. Chem. Soc.

LEAD.

Lead—Action of Distilled Water.—F. Clowes finds that when lead is immersed in ordinary distilled water, much of the lead passes into solution, most probably as hydroxide, and is removable to a large extent from the solution by filtration through paper, from which it can be almost entirely extracted by cold acetic acid. The compound of lead which remains undissolved by the water was found to have the formula PbH_2O_2 . Oxygen in solution was proved to be the principal agent in causing changes in the lead, and that carbon dioxide has a restraining action in proportion to the volume present. It was found that carbon dioxide acted similarly in preventing the solution of lead. The first action of aerated water apparently consists in oxidation and formation of hydroxide, which is then precipitated as hydroxy-

by the carbon dioxide. The action is prevented or retarded by the presence of carbon dioxide in the initial stages. Total immersion of the lead also retards the action in presence of air, although the final result is the same whether the lead be wholly or only partially immersed in the water. Of the substances which prevent this action, sulphuric acid and soluble sulphates are most effective, soluble carbonates are less so, whilst calcium hydroxide is still less so, but when present in larger quantity actually promotes the action.—Pharm. Journ., Mar. 8, 1902, 193; from Proc. Chem. Soc., 18, 46.

Lead Suboxide—Preparation from the Oxalate.—The question of the existence of lead suboxide, Pb_2O , obtained by Boussingault by heating lead oxalate up to the melting point of lead, has been decided in the affirmative by the experiments of S. Tanatar. The author has improved the method, however, by employing a lower temperature than that directed by Boussingault. Obtained at the lower temperature, lead suboxide is a grey-black powder, which is promptly decomposed by solution of sodium hydroxide or by acids into lead oxide and metallic lead (about 48.2 per cent.), while that obtained at the higher temperature is a mixture of lead and lead suboxide, grey-green in color, and has a density of 9.97 to 9.98. The grey-black product having an average density of only 8.342.—Pharm. Ztg., Nov. 10, 1902, 927.

Lead Peroxide—Volumetric Estimation in Minium.—Max Liebig, Jr., proposes a volumetric method for the estimation of lead peroxide in minium which is commendable because of its convenience and rapidity: 0.5 Gm. of the finely sifted minium are placed in an Erlenmeyer flask with a little distilled water, 25 Cc. $\frac{N}{10}$ thiosulphate solution and 10 Cc. of approximately 30 per cent.—or at most 40 per cent.—acetic acid are added, and the mixture is shaken until solution is effected. Now, 10 Cc. of potassium iodide solution (1:10) and 2 to 3 Cc. zinc iodide starch solution are added, and the excess of thiosulphate solution is titrated with $\frac{N}{10}$ iodine solution. The number of cubic centimeters of iodine solution consumed, multiplied by the molecular weight (expressed by the fraction 0.239? Rep.) of the PbO_2 , gives the percentage of the latter in the minium.—Pharm. Ztg., Nov. 20, 1901, 927; from Ztsch. f. angew. Chem., 1901, 828.

Red Lead—Determination of Impurities.—A. Jousser determines the impurities in commercial red lead as follows: Treat 2.5 Gm. of the sample with 20 Cc. of nitric acid, sp. gr. 1.072 (=1 p. of acid, sp. gr. 1.39 and 4 p. of water) by stirring the mixture in the cold until the whole of the Pb_3O_4 is converted into PbO_2 . Then add solution of hydrogen dioxide, with constant stirring, until all the lead peroxide is dissolved, a few drops being generally sufficient. If the sample is pure, a clear solution will result. If it contains added foreign matters, such as colcothar, powdered brick, sand, barium sulphate, these impurities, remaining undissolved, may be collected, washed, dried and weighed.—Pharm. Journ., Sept. 28, 1901, 385; from Journ. Pharm. d'Anvers, 57, 231.

MOLYBDIC ACID.

White Lead—Adulteration with Barytes.—Th. Ludwig the results of analyses of a number of samples of white oil, of the (German) market, representing different lots was as “chem. pure.” Two of them contained a little less than barytes, two contained 50 per cent. and the others respectively 75 and 80 per cent. in round numbers.—Pharm. Ztg., April 1875.

MOLYBDENUM.

Molybdic Acid—Composition of Ammonium Salts.—Rammelsberg repeated the analysis of ordinary molybdate of ammonium, determined its molecular weight cryoscopically, and has found that its formula should be $6\text{NH}_3 \cdot 6\text{MoO}_3 \cdot 5\text{H}_2\text{O}$; this salt may be regarded as intermediate between the di- and tri-ammonic trimolybdates. The salt by Rammelsberg is in reality the tri-ammonic trimolybdate, $(\text{NH}_4)_3\text{H}_6 + 4\text{H}_2\text{O}$; as for the di-ammonic trimolybdate, $\text{H}_4 + \text{H}_2\text{O}$, it is formed by the addition of the calculated quantity of hydrochloric acid to a cooled solution of ordinary molybdate. After twenty four hours a granular crystalline crust is formed, soluble in water at the cold, and very soluble in warm water, but with decomposition on heating. Mono-ammonic trimolybdate occurs under similar conditions with the exception of a different quantity of hydrochloric acid; care must be taken to stir continuously, and to add the hydrochloric acid in small portions. Before long a felted mass of fine needles is formed of the tri-ammonic salt, $\text{NH}_4 \cdot \text{H}_6$, having properties similar to those of the preceding salt. Commercial “molybdic acid” answers as nearly as possible to the formula $\text{NH}_3 \cdot 3\text{MoO}_3 \cdot \frac{1}{2}\text{H}_2\text{O}$. By proceeding as with the other salts, and adding the calculated quantity of hydrochloric acid to a solution of ordinary molybdate, then filtering after twelve hours, and after a slight turbidity, there are formed, after a few weeks, beautiful crystals of the salt $3\text{NH}_3 \cdot 6\text{MoO}_3 \cdot 5\text{H}_2\text{O}$, intermediate between the di- and tri-ammonic trimolybdates. Having observed that the phosphorus of ammonium contained 12MoO_3 , the author tried, as in the case of the above-mentioned salts, whether he could not produce dodecamolybdate. The addition of an excess of hydrochloric acid to a solution of ordinary molybdate gave a white precipitate of small hexagonal prisms of a tri-ammonic pentadecamolybdate, $.15\text{MoO}_3 \cdot 20\text{H}_2\text{O}$, soluble in boiling water; on evaporating at a moderate temperature the salt re-crystallizes without change, but very difficultly. To dissolve this salt, it is necessary to plunge it suddenly into water; otherwise, if we heat up gradually in the water, an altogether different hydrate containing $6\text{H}_2\text{O}$ is formed; the same product is obtained by the desiccation of the salt containing $20\text{H}_2\text{O}$, even at the ordinary temperature. The warm solution of the preceding salt, treated with an excess of hydrochloric acid, gives, on cooling, beautiful brilliant prisms of the tri-ammonic salt.

molybdate, $3\text{NH}_3 \cdot 12\text{MoO}_3 \cdot 12\text{H}_2\text{O}$. The author is of the opinion that all the molybdates, and without doubt even molybdic acid itself, contain the nucleus Mo_3 , and it is for this reason that he has not simplified some of the above formulæ.—Chem. News, May 9, 1902, 228; from Berichte, xxxiv, 153.

Ammonium Molybdate—Criticism Concerning its Reliability as a Test for Hypophosphites, which see under "Phosphorus."

THORIUM.

Thorium Compounds—Radio-Activity.—E. Rutherford and F. Soddy find that the radio-activity of thorium compounds is the consequence of changes in which new types of matter are formed, and they conclude, therefore, that it is a manifestation of sub-atomic chemical change. Thorium, from which ThX has been separated regains its activity with time, but the activity of ThX decreases and has almost completely disappeared when thorium reaches its maximum again at the end of three weeks. Emanating power appears as a property of ThX and not of thorium, and is proportional to the activity of the ThX present. The decay and recovery of emanating power of ThX and thorium are completely analogous to the decay and recovery of radio-activity. These results find their simplest explanation in the view that a secondary change is proceeding in ThX. One of the products is gaseous, and in the radio-active state constitutes the emanation. This change appears more allied to ordinary chemical reaction than the primary, for it is affected by the conditions. The residual activity of thorium would be explained if the chemical change which produces ThX produces also a second kind of active matter, closely allied to thorium in its properties. The radiations of this residual part are composed entirely of rays non-deviable in the magnetic field, whereas the other two components of thorium radio-activity comprise both deviable and non-deviable radiation, thorium being analogous to uranium in that respect. It is found that ThX possesses a distinct chemical behavior which differentiates it from thorium, ammonia being the only reagent of those tried capable of separating it from the latter. The amounts of ThX produced in varying intervals of time between successive precipitations agree with the requirement that ThX is being continuously produced by thorium compounds at a constant rate. The rate of production of ThX and the rate of decay of its activity are apparently unaffected by known agencies. Both changes proceed independently of the chemical and physical conditions of the molecule. The source of the energy required to maintain the radio-activity of thorium over indefinite periods is, therefore, to be found in a chemical change producing new types of matter.—Pharm. Journ., May 31, 1902, 449; from Proc. Chem. Soc., 18, 120.

TIN.

Tin—Simple Test for its Presence.—According to Otto Schmatolla, tin

may be detected in strong hydrochloric acid solution simple test: A glass or porcelain rod, or a test tube filled is dipped in the acid solution. The wet tube is then in colorless Bunsen flame. In the presence of tin, an intense flame will be observed enveloping the glass cylinder, while the HCl is evaporated. Antimony does not interfere with Arsenic, if present in more than equal quantity, prevents the color, and leaves the tube coated with a dark layer of tin. A very minute trace of tin may be thus detected by employment of acid and dipping the tube several times in succession. Platinum wire does not give the reaction.—Pharm. 1901, 473; from Chem. Centralb., 1901, 2, 57.

Tin—Disintegration by Age.—Th. Paul makes some observations concerning the structural disintegration of metallic tin to intense cold or after they have been kept for centuries. Solid utensils constructed of pure white tin are under the microscope completely disintegrated as to form a dusty powder of a structural modification going on, interrupted only now and then. Days, in all white tin vessels and utensils from the very old. Pharm. Ztg., July, 1901.

Arsenic—Standard Method of Determination.—The journal appointed by the Society of Chemical Industry and the Society of Analysts, with the view of deciding upon a standard method of determination of arsenic, and especially of such small quantities present in beer, has recommended that the Marsh-Berzelius method be adopted, as it is stated to give a distinct indication of one part of arsenic oxide in seven millions, with quantities of 20 Gm. of a solid or a liquid. About 20 Gm. of zinc should be placed in a 250 cc. Jena glass, fitted with a 50 Cc. tapped funnel and an exit tube with one end of a drying tube containing a roll of dry paper wool impregnated with lead acetate, next to which is placed ordinary cotton-wool, then a layer of granulated calcium chloride, finally another wad of plain cotton-wool. To the other end of the tube is attached a hard glass tube drawn out to a point, with 0.092 inch in diameter. The zinc in the flask having been washed with water, dilute hydrochloric or sulphuric acid is then run in until all the air has been expelled from the flask, as shown by the blue flame appearing round, the flame of a Bunsen burner is applied to the hard glass tube to show whether a mirror is formed or not, being added from time to time as required. If Jena glass is used throughout and all the materials used are arsenic-free, no mirror is formed in twenty minutes, and the suspected material may be added to the contents of the flask. Standard arsenical mirrors may be formed after adding to the generating flask in turn 2, 4, 6, 8 and 10

ively of a hydrochloric acid solution of arsenious oxide, containing 0.001 Mgm. of As_2O_3 in 1 Cc. A separate tube must be used for each mirror and the hydrogen allowed to come off for twenty minutes before adding the arsenical solution, the Bunsen flame being under the hard glass tube all the time. After adding the arsenical solution, the Bunsen flame must be kept under the tube for another twenty minutes, in order that the mirror may be evenly deposited. The mirrors must be sealed in while the tubes are filled with hydrogen, and should then be mounted on white cards.—Pharm. Journ., Jan. 25, 1902, 61.

Arsenous Acid—Improved Method of Quantitative Estimation.—Lyman F. Kebler observes that the pharmacopœial quantitative method for estimating the purity of arsenous acid gives results which generally indicate over 100 per cent. of arsenic trioxide. This high percentage is chiefly due to the amount of *heat applied*, while monocarbonate or any trace of caustic alkali interferes markedly with the color-reaction of the starch indicator. A better and safer method consists in oxidizing from 0.3 to 0.5 Gm. of the arsenous oxide to arsenic acid by means of nitric acid, evaporating the excess of nitric acid, dissolving the residue in water, and precipitating with magnesia mixture. The ammonium-magnesium arsenate is washed with water rendered alkaline with ammonia, to remove chlorides, then dried at 100° to 105° C. to constant weight and calculated as arsenic according to the following formula: $\text{MgNH}_4\text{AsO}_4 + \frac{1}{2}\text{Aq.}$ —Amer. Drugg., Dec. 9, 1901, 343.

Arsenic—Convenient Determination in Hydrochloric and Sulphuric Acid.—E. Seybel and H. Wikander find the following method for the detection of arsenic in hydrochloric and sulphuric acid to be quite as delicate and greatly more convenient than the method of the Ph. Germ. IV. It depends on the formation of arsenic tri-iodide, which is very difficultly soluble in the acids named. On addition of a few drops of concentrated solution of potassium iodide to several Cc. of hydrochloric acid, a distinct yellow precipitate forms if the acid contains 0.05 Gm. As_2O_3 in one liter, and a yellow color in presence of 0.01 Gm. per liter. In the case of sulphuric acid, which must first be diluted to a sp. gr. of about 1.45, these reactions are quite as distinct, but it must be remembered that a yellow color will be developed in sulphuric acid free from As_2O_3 on prolonged contact with KI.—Pharm. Ztg., Feb. 1, 1902, 91; from Chem. Ztg., 1902, No. 5.

Arsenic—A Contaminant of Aqua Ammonia, which see under “Alkalies.”

Arsenic—Observation of its Presence in Malt-Kilns.—In the dust from the under surface of the floor-tiles of a malt-kiln in which “arsenical coke” had been burnt, T. Fairley has found as much as 1 per cent. of As_2O_3 , and the least found was 0.2 per cent. The tiles themselves con-

BISMUTH SUBOXIDE.

tained, when glazed, from 0.3 to none ; when unglazed, from 0.01 to 0.02 per cent. ; the dust from the walls of the melting pot, from 0.02 to 0.06 ; from the space below the melting pot, from 0.0025 to 0.005 ; from the screening machines, 0.01 to 0.02. —*Pharm. Journ.*, Aug. 17, 1901, 253 ; from *Analyst.*, 26, 177.

Sodium Arsenate—Detection of Phosphate.—F. J. C. observes that the usual qualitative test for a phosphate with ammonium molybdate is not applicable in the case of sodium arsenate because both arsenates and phosphates react with ammonium molybdate. The method that is usually adopted in such cases is to reduce the arsenate to arsenite by means of sulphur dioxide, the solution being acidified with hydrochloric acid. When reduction is complete, the solution is driven off by evaporation, hydrogen sulphide is passed through the residue, arsenous sulphide, and the filtrate tested for phosphate with ammonium molybdate. This method works well.—*Pharm. Journ.*, Aug. 17, 1901, 253.

ANTIMONY.

Antimonuretted Hydrogen—Method of Purification.—Alfred Stock and Walther Doht, antimonuretted hydrogen, as prepared, has never been pure, containing either carbon dioxide or hydrogen sulphide. They obtain it in a pure condition by passing a strong aqueous solution of tartaric acid, together with a powdered alloy of zinc and antimony, containing 25 per cent. of antimony, through water. The liberated gas is passed through water, condensed by means of liquid air, when the H_3Sb is solidified, leaving free hydrogen not being solidified. Pure H_3Sb has a peculiar odor, somewhat resembling that of H_2S , and quite different from H_3P and H_3As . It is quite stable when kept from moisture.—*Pharm. Journ.*, Feb. 15, 1902, 121 ; from *Chem. News*, 1902, 121.

Lithium Antimonide—Preparation and Properties.—Lithium and antimony unite easily when fused together. On the application of much heat, the reaction is so violent that it is difficult to obtain a definite compound of the two elements by direct fusion. By submitting a mixture of equal quantities of potassium antimonide to electrolysis, employing a cathode of lithium, Lebau has succeeded in obtaining lithium antimonide of a slate-grey color in a definite crystalline condition, which is insoluble in water with the evolution of pure hydrogen. Its melting point is probably higher than that of the component metals. This method is available for the formation of alloys of lithium with other metals. The author has thus prepared alloys of lithium with tin.—*Pharm. Journ.*, April 5, 1902, 273 ; from *Chem. News*, 1902, 273.

BISMUTH.

Bismuth Suboxide—Formation from Oxalate.—A. C. C.

basic bismuth oxalate, $\text{Bi}_2\text{O}_3(\text{C}_2\text{O}_4)_3$, is split up when heated into bismuth suboxide, BiO , and carbon dioxide. The suboxide is a fine black powder which glows when heated, and is converted into yellow bismuth oxide. A method previously described by Schneider (1899) consists in reducing bismuth oxide by means of stannous chloride, but the correctness of the method has been disputed.—Pharm. Ztg., Nov. 20, 1901, 927; from Ztschr. f. angew. Chem., 1901, 437.

MERCURY.

Mercury—Determination in Salts.—For several years T. and C. T. Tyrer have employed a modification of the hypophosphorous acid method, which is carried out as follows: 3 to 5 Gm. of the substance is dissolved in nitrohydrochloric acid, the solution filtered if necessary, and caustic soda solution is added until a permanent precipitate is formed. On the addition now of hypophosphorous acid a white precipitate is formed. This slowly turns black, the change being accelerated by boiling and cooling, until there remains a black precipitate with clear supernatant liquor. The precipitate is collected upon a tared double Swedish filter, washed successively with water, alcohol, and ether, and dried in an air-bath maintained at 98°C . by means of a thermostat. The beakers should be heated on a plate to prevent bumping, and sufficiently capacious to avoid loss by spurting during the evolution of gas. The method has given very satisfactory results, having been used for all kinds of mercurials, as well as complex mercurial residues. The authors have now compared it with other reductive methods—such as the stannous chloride, formaldehyde, phenylhydrazine hydrochloride, sodium arsenite, and tartar emetic methods, and point out certain defects in all of them. Low results are obtained with stannous chloride and with formaldehyde; the reduction is incomplete with phenylhydrazine, as also with sodium arsenite, while with tartar emetic the product is traces of an antimony salt.—Trans. Brit. Pharm. Conf., 1901, 405-407.

Aluminum Amalgam—Preparation.—According to Carlo Formenti aluminum amalgam is easily prepared from aluminum fragments, filings, etc., by first washing them in diluted soda solution, to remove fat, then with diluted nitric acid, and finally with water and drying. The perfectly dried metal is then mixed with an excess of mercury and heated in a well-covered vessel to gentle ebullition over a Bunsen flame. Combination is thus rapidly effected. The excess of mercury having been decanted, the residual amalgam is broken up and preserved in well-stoppered containers under ligroin. The amalgam rapidly decomposes water at the ordinary temperature with evolution of hydrogen.—Pharm. Ztg., Sept. 4, 1901, 705; from Boll. Chim. Journ., 1901, 519.

Iron Amalgam—Superficial Formation of Ferrous Oxide on Exposure.—According to J. Férée, the black powder which covers solid iron-amal-

gam when exposed to the air was found by him not to be metallic iron, but ferrous oxide, FeO . On contact with water it is converted into Fe_2O_3 . The action goes on slowly in dry air, the product being nearly pure ferrous oxide.—Pharm. Journ., Aug. 24, 1901, 273; from Bull. Soc. Chim. (3), 25, 615.

Mercuric Chloride—Preservation of Its Solutions.—At the request of the Council of the Pharm. Society of Great Britain, Henry George Greenish and F. A. Upsher Smith have made and now record the results of an investigation to determine the change, if any, which solution of mercuric chloride undergoes according to the nature of the bottle in which it is kept, the following being a summary of their experiments: (1) That solution of mercuric chloride in distilled water will keep satisfactorily in white, green or blue bottles for a reasonable length of time if not exposed to direct sunlight. (2) That even in direct sunlight it will keep, if protected by the use of amber glass; they, therefore, recommend the use of bottles made of such glass. (3) That the ordinary white glass bottles, whether of English, German or French manufacture, as sold to pharmacists, do not appreciably differ in their action. (4) That the minute deposit gradually formed is partly or wholly mercurous chloride. (5) That mercuric chloride with tap water gives a copious precipitate in blue, green or white glass bottles; the precipitate will not form, however, in amber bottles or in darkness. (6) That in diffused light amber bottles preserve the solution better than blue, green or white bottles. (7) That in strong light the amber glass alone is satisfactory. (8) That strong light effects more decomposition than diffused light, especially with tap water.—Pharm. Journ., Mar. 15, 1902, 215-217.

Ammoniated Mercury—Precaution in Drying.—Speaking of the Pharm. Germ. IV test of solubility in diluted acetic acid, K. Dieterich observes that if ammoniated mercury is prepared according to the official formula and dried at exactly (not exceeding ? Rep.) 30°C ., it will dissolve perfectly even in the cold; but on heating the clear solution above 70°C ., deposition occurs. Ammoniated mercury dried at a higher temperature than 30°C ., however, does not form a clear solution even by the aid of heat. To carry out the test properly the compound must be in the condition of an extremely fine and dry powder; solubility may then be effected in the proportion of 1 part in 100 dilute acetic acid at a temperature not above 70°C . The author proposes that 0.2 Gm. of finely triturated ammoniated mercury be added to 20 Gm. of dilute acetic acid heated to 70°C . contained in a small beaker. On gently rotating the beaker, solution is effected. Friction with a glass rod is to be avoided.—Pharm. Centralh., Aug. 1, 1901, 405; from Helf. Annal., 1901.

SILVER.

Silver Arsenite—Composition of the Canary-Yellow Compound.—J.

Alfred Wanklyn reports the results of a recent analysis of the canary-yellow silver arsenite, which, as is well known, is produced when the gas from the Marsh's apparatus is led into solution of silver nitrate. The composition of this compound is given in text-books as $2\text{Ag}_2\text{O}, \text{As}_2\text{O}_3$. The analytical figures obtained with the carefully purified compound, dried on the water-bath, correspond to the formula $3\text{Ag}_2\text{O}, \text{As}_2\text{O}_3$, and this formula was confirmed by a synthetic experiment. It is noteworthy that the yellow color of the precipitated silver arsenite was not lost on drying.—Chem. News, April 18, 1902, 181.

THALLIUM.

Thallium—Volumetric Estimation.—V. Thomas employs a modification of Feit's method for estimating thallium volumetrically. A thallic salt is treated with potassium iodide, and a greenish-black precipitate is obtained. This may be considered as a mixture of thalious iodide and iodine, resulting from the decomposition of an unstable triiodide, $\text{TlI}_3 = \text{TlI} + \text{I}_2$. To estimate thallium volumetrically the solution should contain the metal in the form of thallic sulphate, and the transformation into thallic sulphate is absolutely necessary in the case of thallium existing in the liquid in the form of a halogen salt. Excess of potassium iodide is added, and enough arsenous solution to produce a pure yellow precipitate of thalious iodide. This is filtered, and to a portion of the filtrate excess of arsenous acid is added.—Chem. & Drugg., June 28, 1902, 995; from Compt. rend.

ORGANIC CHEMISTRY.

HYDROCARBONS.

Hydrocarbons of the Paraffin Series—Action on Inorganic Salts.—As the result of a series of experiments, W. H. Seaman finds that all inorganic salts are insoluble in hydrocarbons of the paraffin series, and that, with the single exception of ammonium carbonate, there was no change observable. In this case a brownish color was developed when the salt was kept in contact with paraffin, the cause of which has not been ascertained.—Pharm. Journ., Dec. 21, 1901, 691; from Proc. Amer. Chem. Soc., 1901, 130.

Roumanian Petroleum—High Hydrocarbon Content.—Dr. A. B. Griffiths and N. J. Bluman state that Roumanian petroleum is composed of hydrocarbons of various series, such as methane, ethylene, acetylene and benzene, as well as cyclohexanes or saturated cyclic hydrocarbons. They have recently analyzed a sample of crude Roumanian petroleum, and found the following products: Benzin, 10.65 per cent.; illuminating oil (1st

quality), 61.20 per cent. ; illuminating oil (2d quality), 20.1 per cent. ; paraffin, 2.83 per cent. ; coke and loss, 5.24 per cent. The results justify the praise which has been bestowed on Roumanian petroleum. The raw petroleum yielding 81 per cent. of illuminating oil should be the basis of an important industry. The authors agree that this petroleum contains very little oxygen (less than 1 per cent.), and they have recovered a basic nitrated compound in it having the odor of pyridine. This was effected by shaking up the petroleum with a 24.5 per cent. solution of sulphuric acid. From this mixture, after adding ether and extracting with ether, they obtained a deep brown-colored liquid, boiling at 117°C . This substance is very slightly soluble in water (pyridine is easily soluble) ; it is, however, soluble in benzene, and the mineral acids. It gives a crystalline precipitate with chloride of platinum and with ferrocyanide of potassium. This body when purified gives figures which, together with those obtained by treating a warm solution of the substance, the authors obtain, which proves it to be pyridine ($\text{C}_5\text{H}_5\text{N}$), or a substance analogous to it. *News*, March 27, 1902, 155 ; from *Bull. Soc. Chim. de Paris*, No. 14.

Scottish Shale Oil—Bases Isolated and Identified.—F. C. Smythe and A. Smythe have isolated and identified the following bases from Broxburn shale oil boiling below 164°C . : Pyridine, b. p., 111°C . (very small quantity) ; α -picoline, b. p., 129.5°C . (bar., 763 Mm.) ; α -methyl pyridine, b. p., 159°C .– 159.5°C . ; $\alpha\beta'$ -dimethyl pyridine, b. p., 142.5°C . (bar., 760 Mm.) ; $\alpha\gamma\alpha'$ -trimethyl pyridine, b. p., 170.5°C . (bar., 760 Mm.). α,β' -dimethyl pyridine is a liquid with a strong pyridine-like odor ; it gives a picrate, m. p., 156°C . ; a gold compound, m. p., 156°C .– 157°C . ; a platinichloride compound containing 6 molecules of water and melting (when anhydrous) at 238°C . ; and a mercurichloride, $\text{C}_7\text{H}_9\text{HCl}, 6\text{HgCl}_2$, in very small crystals, m. p., 163°C .—*Pharm. Journ.*, Mar. 8, 1902, 193 ; *Chem. Soc.*, 18, 47.

Ichthyol—Incompatibles.—Frederick W. Haussman very thoroughly discusses the nature of the incompatibilities of ichthyol, which occurs with a greater number of substances—both organic and inorganic—than is generally supposed. Thus many of the alkaloidal salts, for instance, are incompatible with it, and the same is true of inorganic salts of every description. The reader must be consulted in the original, in *Merck's Rep.*, 284–285.

Ichthyol—Incompatibilities in Solution.—F. A. Upsher Smith has made some experiments with the object of finding out whether ichthyol can be easily dispensed in the form of mixtures. Several solutions were obtained by dissolving ichthyol (ammonium-sulphoichthyolate) in wat-

tions of 1 drachm in $1\frac{1}{2}$ fluid ounces. The resulting solutions remained clear during 1 year, one of them being kept for the purpose. To the other solutions he added in one case 1 fluid drachm of diluted hydrochloric acid ; in another 1 fluid drachm of aromatic spirit of ammonia. In both of these precipitates form with more or less rapidity, and ultimately all of the ichthyol was thrown out of solution in the form of immiscible compounds. It follows that ichthyol is decomposed in acid or alkaline media, and that if solutions are prescribed these should be made with neutral aqueous media, such keeping well for many months.—Pharm. Journ. Feb. 1, 1902, 86.

Methane—New Synthetic Method of Formation.—P. Sabatier and J. B. Senderens describe a new method for the synthesis of methane, which is based upon the extraordinary catalytic power, with regard to the addition of hydrogen, possessed by metallic nickel reduced from its oxide at as low a temperature as possible. Various syntheses have been effected by this reaction, and it is now stated that methane can be produced by passing over reduced nickel at 250° to 300° C., either carbon monoxide or dioxide mixed with a slight excess of hydrogen, thus $\text{CO} + \text{H}_2 = \text{CH}_4 + \text{H}_2\text{O}$, or, $\text{CO}_2 + \text{H}_2 = \text{CH}_4 + 2\text{H}_2\text{O}$. It is apparent that methane can thus be formed from its elements in two stages only.—Pharm. Journ., March 22, 1902, 233 ; from Compt. rend., 134, 514.

VOLATILE OILS.

The Volatile Oils of the U. S. P., 1900.—Under this title Prof. Edward Kremers expects to report monthly in the Pharmaceutical Review on the volatile oils that are to enter the next edition of the U. S. Pharmacopœia, with the principal object of making his comments upon them the basis of wider discussion. The installments published in the numbers from March to June, 1902, embrace the following oils: Oleum Amygdalæ Amaræ; Oleum Anisi; Oleum Aurantii Corticis; and Oleum Aurantii Florum. These admirable papers bring the subject under consideration up to the date of the most recent investigation, and will prove highly interesting as a source of information concerning the modern views held as to the constitution of volatile oils.

Volatile Oils—Specific Gravities and Coefficients of Expansion.—Having in a previous paper shown that the changes in the specific gravities of a small number of solutions and liquids by a rise in temperature are often so small that they might be neglected altogether for practical purposes, Oswald Schreiner and W. R. Donner have now undertaken a study of the changes which the volatile oils undergo in their specific gravities under the same conditions, since these constitute a large part of the liquids in the Pharmacopœia. The only systematic work hitherto undertaken in the same direction is that of A. B. Lyons, in 1885, and of Schimmel & Co., in 1887. Lyons determined the changes that occur in specific gravities with

changes in temperature of a small number of volatile oils, using for this purpose a dilatometer—a flask like an ordinary pycnometer, with the stopper extended into a graduated and accurately calibrated tube. By filling the dilatometer up to one of the lower marks and then warming the entire instrument in a bath, the expansion of the liquid can be read off, and from this increase in volume the change in the specific gravity can be calculated. Schimmel & Co.'s results were obtained by direct specific gravity determination of a large number of volatile oils at 10° , 15° and 20° , their results being given in a table together with three added columns, showing the changes in specific gravity for each degree between the limits 10° – 15° , 15° – 20° , and the average for each degree between 10° – 20° . In the present investigations, which were made with a total of sixty-one samples, comprising thirty-two oils donated by representative manufacturers, the specific gravities were taken with the pycnometer, and the determination extended to the fourth decimal, whereas Schimmel's determinations only extended to the third decimal. The pycnometer used was Oswald's modification of the Sprengel tube, the ends being protected by glass caps. Three specific gravities were taken for each sample, one at 15° , one at 20° , and one at 25° , the weight of distilled water which the pycnometer holds at the same temperature having previously been determined. The pycnometer having been filled with the oil cooled to below 15° , it was immersed, all but the tips, in a bath kept constant at 15° ; the oil as it oozed out at the tips was absorbed by the filter paper, and when no more oozed out, the tips were put on, the pycnometer removed from the bath, carefully wiped and weighed. After weighing the caps were again removed and the process repeated in a bath at 20° , and finally in a bath at 25° . The results given in the table (III), which, as well as the tables of Lyons and of Schimmel & Co., must be consulted in the original, show that the change in specific gravity of the volatile oils for each degree is comparatively small, and nearly uniform between the limits 15° and 25° for any one oil, and that this change is not very different for different oils. The average of all the figures is 0.00064, and this may be safely accepted as the factor for the correction of the specific gravities of all the volatile oils with possibly few exceptions. To exemplify: The specific gravity of oil of lemon is found to be 0.853 at 23° , as compared with water at this temperature. It is desired to know its specific gravity at 15° . The factor 0.00064 is multiplied by the difference between the temperature 15° and 23° , or 8, and this result is added to the specific gravity found at 23° . The result is $0.853 + 0.00512 = 0.858$, the last two decimal places being dropped; and this result will be the specific gravity at 15° as compared with water at 15° .

The authors, using the experimental data obtained in determining the specific gravities, have made some calculations to ascertain the coefficients of expansion of the volatile oils under examination. Laying down the

formula used in making the calculations, the results are given in a table (IV.) showing the coefficients of expansion between 15° and 25° C. They admit that the limit of ten degrees is rather small for such work, and that, while their work is accurate within these limits, further work is necessary for the accurate determination of the coefficients of expansion of the oils examined. The average of twenty different oils is nearly 0.000900, the lowest being 0.000740, the highest 0.000940.—Phar. Archives, Sept., 1901, 165-175.

In a criticism on the above work of Schreiner and Donner, Dr. A. B. Lyons finds fault with the fact that these investigators have adopted as a standard of comparison in each case water at the same temperature as the liquid under examination. The information given in their table (III.) is therefore not immediately available for practical use. In practice we take specific gravities with some instrument which assumes as a standard of comparison water at some arbitrarily fixed standard. Dr. Lyons has, therefore, constructed a table based mainly on the figures given by the authors named, the main feature of which is this practical connective factor, accepting the figures as they stand as the specific gravities at 15° , but giving as that for 25° , the specific gravities, as they would be given by direct observation with hydrometer, pycnometer or Westphal balance. In this table a third column gives the correction for each degree Centigrade and a fourth column the coefficient of expansion deduced from the changes given in table III. of the authors criticised. The list includes some oils, the specific gravities of which have been recently determined by Dr. Lyons with the dilatometer. From all of these the author concludes that if the temperature of observation is anywhere within the ordinary range, it is apparently quite feasible to establish an average corrective factor. Such would be 0.00081 for one degree, corresponding with a coefficient of expansion of about 0.00089.—Pharm. Archives, Jan., 1902, 1-4.

In a rejoinder to the foregoing criticism of Dr. Lyons, Mr. Schreiner agrees that the suggestion to make the correction for any changes in temperature by always referring the results to standard temperature, is a good one, but he does not agree as to the temperature chosen in Dr. Lyons' article as standard. No definite conclusion can be reached until the Committee of Revision decides upon a standard of temperature for the new Pharmacopœia; and if the U. S. P. makes a change in its standard temperature, it will certainly be a change to $\frac{2}{3}0^{\circ}$ or $\frac{2}{3}5^{\circ}$ and not $\frac{2}{1}0^{\circ}$ or $\frac{2}{1}5^{\circ}$ or any such combination. Hence Mr. Schreiner and his co-laborers preferred to state their specific gravities at these temperatures.—*Ibid.*, 4-6.

Volatile Oils—Value of the Refractive Index.—Utz has made a comprehensive study of the refractive indices of volatile oils, covering some fifteen hundred determinations on a large number of oils, mostly of authentic origin. These determinations prove the comparative valuelessness of the refractive index as an analytical factor in determining the purity of the

majority of essential oils, except under special circumstances. This figure is of the highest importance in the determination of the purity of a definite compound, and has often been strongly recommended as an aid to the practical examination of commercial specimens of essential oils, the fact of their being mixtures with widely varying limits in this respect being too often lost sight of. Pure East Indian sandalwood oil, for example, yields figures from 1.5067 to 1.5078 at 15° C. Cedarwood oil, perhaps one of the commonest adulterants, gives 1.5004 to 1.5048, and West Indian sandal oil from 1.5119 to 1.5132. Admixtures containing a large amount of the cheaper oils could easily be made which would give figures well within the limits for the pure sandal oil, but which would easily be revealed by the employment of other well-recognized methods. The same is true to an even greater extent in the case of lavender and spike oils, peppermint and camphor, lemon oil, and lemon terpene, and many other oils. At the same time the exhaustive tables giving the results of all the determinations are of great interest, and also of value in certain cases.—Apoth. Ztg., Oct. 16, 1901, 743–746.

Volatile Oils—Method of Determining Phenols and Alcohols.—A. Verley and F. Boelsing find that alcohols and phenols which only combine slowly with acid anhydrides in the cold become esterified almost immediately in the presence of pyridine, according to the equation: $R.OH + (R'.CC)_2O + Py = R.O.CO.R' + R'—COOHPy$. The method is applicable both to the formation of esters from alcohols and phenols, and for the determination of those bodies in essential oils. For the latter purpose a reagent consisting of a mixture of anhydrous pyridine, 88 Gm., and acetic anhydride, 12 Gm., is employed. From 1 to 2 Gm. of the alcohol or phenol-containing substance is heated for a quarter of an hour with 25 Cc. of the mixture, then treated with 25 Cc. of water, and the uncombined acid determined in the usual manner, with semi-normal alkali; the difference between the amount of acid thus found and that in a blank experiment gives the amount combined as ester. Satisfactory results were obtained with ethyl, amyl, and cinnamyl alcohols, phenylglycol, glycerol, phenol, β -naphthol, guaiacol, thymol, carvacrol, santalol. Terpeneol, vanillin, salicyl aldehyde, benzyl alcohol and linalool gave no reaction. Geraniol only gave about 90 per cent. of the amount of the alcohol present, as shown by determination with phthalic anhydride. For menthol, a greater excess of acetic anhydride than the above was necessary to obtain quantitative results.—Pharm. Journ., April 12, 1902, 294; from Berichte, 34, 3354.

Volatile Oils—Quantitative Estimation in Spices.—C. Mann recommends the following practical process for quantitatively estimating the volatile oil in spices: 20 Gm. of the spice are mixed with 10 Gm. of pumice in fragments and distilled in a current of steam. The distillate is salted out, shaken with 50 Cc. of rhigolin (a mixture of hydrocarbons,

chiefly pentane and hexane, b. p. 20° – 35° C.), and, the volume of rhigolin having been brought to exactly 50 Cc. to compensate for evaporation, 25 Cc. of the solution are transferred by means of a pipette to a weighing glass and evaporated. The weight ascertained, multiplied by 10, gives the percentage of oil contained in the sample. Special modifications of the process are also described for determining the volatile oils in liqueurs, in soaps, and in perfumeries, the author's very exhaustive treatment of the subject covering twenty-six pages in *Archiv d. Pharm.*, 1902, No. 2 and 3 (Feb. 27 and April 15), p. 149–166.

Terpeneless Volatile Oils—Characters and Advantages.—Dr. Rudolf Hefelmann interestingly reviews the progress made during the last three decades of the nineteenth century in clearing up the intricate composition of the volatile oils, the exact study of which has become possible only since, by their systematic investigations, Wallach and his disciples have succeeded in characterizing their terpenes and classifying them in well-defined groups. Among the terpenes, as is now well recognized, the terpenes proper, $C_{10}O_{15}$, and the sesquiterpenes, $C_{15}H_{24}$, play the most important rôle, the polyterpenes and olefinic terpenes being relatively unimportant. The terpenes proper are characterized by their low boiling points, low specific gravities, complete insolubility in diluted alcohol, faint aroma, and the facility in which they become oxidized and resinified in the presence of light, air and water. They frequently exhibit among each other a great similarity in odor and taste, and do not impress a specific character upon the oil of which they form a constituent part; indeed, the faintly aromatic terpenes are not alone devoid of a pronounced odor, but their presence serves to mask to a certain extent the specific odor of their oxygenated associates—the alcohol, aldehydes, ketones, phenols, and esters, which are the true odor-carriers of the volatile oils. In contrast with the terpenes, these oxygenated components of the volatile oils, when completely deprived of the terpenes with which they are associated, are characterized by great stability, delicacy and augmentation of perfume, ready solubility in diluted alcohol, greater solubility also in water, higher specific gravity, &c., than are characteristic of the normal oil. These distinctions were first applied practically by the firm of H. Haensel who exhibited terpeneless oil of caraway at the Centennial Exposition in 1876 prepared on an industrial scale by a process discovered by a member of the firm, Mr. Gustav Haensel. Since then this firm has succeeded in producing a large number of terpeneless volatile oils, which consist exclusively of the oxygenated components of the respective oils in their normal proportions. The precise process for the preparation of terpeneless oils has not been revealed, but so much is known that the process is one in which fractionation is largely if not exclusively concerned. That the production of these terpeneless oils will not be confined to a single firm is clearly indicated by the fact that an English chemist has recently suc-

The following concerning certain terpeneless volatile oils and their solubilities in alcohol of different strength is given in Heinrich Haensel's Report, 1901 :

Oil of Bergamot.—The terpeneless oil is soluble in 2.5 volumes of 70 per cent., 5.9 vol. of 60 per cent., and in 24 vol. of 57 per cent. alcohol.

Oil of Cedar Wood.—The terpeneless oil has the sp. gr. 0.9905 at 15° C.; optical rotation, +18.15 in 100 Mm. tube at 20° C., and a solubility of 1 volume in 1.02 vol. of 80 per cent., 12.5 vol. of 70 per cent., and 200.0 vol. of 60 per cent. alcohol. Ordinary cedar-wood oil requires from 10 to 20 times its volume of 90 per cent. alcohol for solution.

Oil of Lemon.—The terpeneless oil gives a clear solution with 265 times its weight of 60 per cent. alcohol, and this test determines the complete absence of terpenes.—Pharm. Centralh., Aug. 15, 1901, 495.

Alcohols and Phenols in Volatile Oils—Quantitative Estimation.—A new method for the quantitative determination of alcohols and phenols, with special reference to eugenol in oil of cloves, has been proposed by A. Verley and Fr. Bölsing, which is based on the following conditions: Whilst a mixture of alcohols (or phenols) with acetic anhydride reacts but slowly at a low temperature, a strong reaction occurs immediately, with a great increase in the temperature, if pyridine is present, whereby the acetic acid formed during the process at once combines with the pyridine and, for this reason, the ester formed cannot possibly be saponified again. Pyridine behaves in a neutral manner towards phenolphthalein, and it is therefore an easy matter to determine, by titration, the quantity of acetic acid contained in a mixture with pyridine. The process is carried out as follows: 1 to 2 Gm. of the alcohol, or phenol, as the case may be, are placed in a flask of about 200 Cc. capacity, together with 25 Cc. of a mixture consisting of about 120 Gm. acetic anhydride and 880 Gm. pyridine, and heated on a water bath for 15 minutes. After cooling, the whole is diluted with an equal quantity of water (for the purpose of converting the unchanged acetic anhydride into acetic acid, or pyridine acetate), and the acetic acid not combined with the alcohol or phenol is titrated back. The content of acetic acid in the pyridine and acetic anhydride mixture having also been ascertained, the quantity of acetic acid combined with the alcohol or phenol is ascertained by difference, and from this the alcohol or phenol content calculated.—Schimmel's Rep., April, 1902, 25.

β-Bromo-Camphor—A New Compound.—H. F. Armstrong and T. M. Lowry have obtained a new bromo-camphor, which is very similar to ordinary bromo-camphor, but has a melting point of 79° C. when perfectly purified. The optical rotatory power of the new compound is also very different from that of α-bromo-camphor, a solution in acetone containing 3.3 per cent. giving $[\alpha]_D = 18^\circ$, the corresponding value for the α-bromo-camphor being 143°. Recently, larger quantities of material have been

the parent term of the β -series by its direct oxidation into β -bromo-camphoric acid. Simultaneously with the authors, Dr. M. O. Forster has obtained β -bromo-camphor by simply brominating the isomeride of camphor which he has described under the name of hydroxycamphene. A direct comparison of the products from the two sources has been made, which leaves no doubt as to their identity. Dr. Forster states that β -bromo-camphor, $C_{10}H_{15}OBr$, crystallizes from alcohol in long, colorless, prismatic needles and separates from petroleum in transparent, well-formed prisms; it melts at $78^{\circ}C.$, has $[\alpha]_D + 19^{\circ}$ in alcohol and $[\alpha]_D + 16^{\circ}$ in chloroform. Alcoholic potash eliminates bromine from the substance and converts it into an unsaturated acid which belongs probably to the campholenic series. The oxime crystallizes from alcohol in lustrous, rhomboidal plates which melt at $156^{\circ}C.$ —Pharm. Journ., Dec. 28, 1901, 715; from Proc. Chem. Soc., 17, 245.

Limettin—Chemical Constitution.—W. A. Tilden and H. Burrows have undertaken experiments with the object of determining the structure of the group C_8HO_2 , which Mr. Tilden had previously shown to exist in limettin, $C_{11}H_{10}O_4$. It is considered highly probable that the structure of the group C_8HO_2 is similar to that in the ring in coumarin, dibromocoumarin behaving exactly in the same way. Dibromo-limettin, having the melting point $297^{\circ}C.$, when treated with potash, gives the corresponding coumarilic acid, from the potassium salt of which the methyl ester, having the melting point $181^{\circ}C.$, was prepared. On subjecting dibromolimettin to further action of bromine in a sealed tube, a tribromo derivative was prepared containing two hydroxyl groups; the corresponding diacetyl compound melts at $244^{\circ}C.$ The following chlorine compounds have been prepared: Monochlorolimettin, which melts at $242^{\circ}C.$ and is not acted upon by solutions of alkaline hydroxides; dichlorolimettin melts at $275^{\circ}C.$, and, like the dibromo-compound, with potash gives monochlorocoumarilic acid; the trichloro-derivative prepared by Tilden similarly gives dichlorocoumarilic acid. When limettin is heated on the water-bath with a solution of sodium ethoxide, the sodium salt is quickly deposited. Attempts to prepare the methyl derivative were unsuccessful, but when the silver salt was heated with a solution of methyl iodide in methyl alcohol, a substance which crystallized in white tufts of needles (m. p. 189°) was isolated, together with re-formed limettin. Analyses showed the substance to have the formula $C_{12}H_{12}O_4$, differing from limettin by CH_2 . Its chemical properties are similar to those of limettin, as it readily forms a bromo-derivative and a coumarilic acid.—Pharm. Journ., Dec. 7, 1901, 639; from Proc. Chem. Soc., 17, 216.

Methyl Ester of Anthranilic Acid—Detection and Quantitative Estimation in the Volatile Oils.—The property of methyl ester of anthranilic acid, as a primary aromatic base, of forming azo-dyestuffs may be utilized accord-

ing to E. Erdmann for the detection and quantitative estimation of this body in volatile oils. For this purpose the diazotized solution of the ester, made up to a definite volume, is titrated with an alkaline solution of 3 naphthol, when the dye-stuff formed is precipitated. The presence of methyl ester of *methylantranilic acid*, which during the reaction passes over into the nitroso-compound, does not affect the estimation. The process, illustrated by several examples, gives satisfactory results.—Schimmel's Rep., April, 1902, 51; from Berl. Berichte, 35 (1902), 27.

Methyl-Nonyl Ketone—Derivatives.—According to H. Carette, hydrocyanic acid reacts with methyl-nonyl ketone only when a few drops of concentrated ammonia liquor are added. The product of the reaction is a brown oil which decomposes very readily, and cannot be distilled without strong decomposition even under greatly reduced pressure. When this product is heated with concentrated hydrochloric acid, it yields a crystalline product.

Methyl-Nonyl Glycollic Acid Amide, having a melting point 86° to 87° C. From the presence of this body the author concludes that the first named product represents the corresponding nitrite. If this nitrite is treated for some time with strong acid at the temperature of the water-bath, two reaction products are formed, melting at 45° and 185° C. respectively. The lower melting product is recognized by the author as "methyl-nonyl-oxyacetic acid."—Schimmel's Rep., April, 1902, 61; from Compt. rend., 134 (1902), 477.

Methyl Salicylate—Production and Occurrence in Beech Seedlings.—According to the investigations of P. Talleur the young seedlings of the beech contain a glucoside and a diastase which, in the presence of water, react and produce methyl salicylate. It is, however, characteristic of the germinative period of the beech, being confined to the germinating hypocotyl. No trace is found in the seed, or in the old seedlings.—Pharm. Journ., July 6, 1901, 1; from Compt. rend., 132, 1235.

Phellandrene—Distinctive Characters as Obtained from Different Oils.—Schreiner states that the phellandrene nitrosite obtained from the oils of pimento and ginger is of a different character from that obtained from eucalyptus oils. Starting with a eucalyptus oil rich in phellandrene, sp. gr. 0.8692, and rot. p. $-53^{\circ} 35'$, he obtained crude phellandrene nitrosite which had rot. p. $+28.5^{\circ}$; he then obtained by recrystallization from acetic ether, and by fractional crystallization from methyl alcohol, two nitrosites, of which one melted at 120° – 121° C., and had a rot. p. of $+123.5^{\circ}$ C. in chloroform; and the other melted at 105° – 106° C., and had a rot. p. of -36° C. in chloroform. The melting point of the nitrosite has been variously recorded by other observers as lying between 94° and 105° C. The explanation of these differences is clearly that either two nitrosites of phellandrene or the nitrosites of two different terpenes

another nitrosite melting at 94° C., and zingiberine nitrosite melting at 97° – 98° C.—Chem. & Drugg., Sept. 14, 1901, 466 ; from Chem. Centralbl., 1901, ii, 544.

Terpenic Esters and Alcohols—Solubility of Both in 50 per cent. Sodium Salicylate Solution.—G. Darzens and P. Armingeat find that the method of determining the proportion of terpenic alcohols and esters in their admixtures by means of the solubility of the first and insolubility of the last named in 50 per cent. sodium salicylate solution, as first suggested by Duyk, and subsequently adopted by Charabot and Hebert, is not even approximately accurate. Experimenting with admixtures of alcohols and esters in known proportions, they find that the portion soluble in the reagent still retains a large amount of ester ; while the insoluble layer, which should consist wholly of esters, retains a correspondingly great quantity of the alcohol.—Pharm. Journ., Feb. 8, 1902, 102 ; from Bull. Soc. Chim., 25, 1053.

Oil of Bergamot—A New Crystalline Constituent.—H. von Soden and W. Rojohn have isolated from the residues of the distillation of oil of bergamotte a crystalline body, which they consider new, and have named

Bergaptin. It appears to be closely allied to the bergaptene of Pomeranz. It crystallizes from petroleum ether in white tablets, and from ether in yellow cubes. It contains no phenolic nor methoxyl groups ; it is saponified by alkali, and regenerated when the saponification product is treated with acid.—Pharm. Zeit., Sept. 26, 1901, 778.

Oil of Bergamot—A New Adulterant and Its Detection.—Dr. Salvatore Gulli states that the adulteration of oil of bergamot by means of turpentine, either crude or rectified, as well as by the bergamot distillate, or by means of isomeric peel essences, has almost ceased, because of the ease with which they are modernly detected. Instead of these a mixture of chloro-derivatives of oil of turpentine, obtained by saturating the oil with a current of hydrochloric acid gas, is now so successfully used, that it may be present to the amount of 5 or even 10 per cent. without losing the constants of the pure bergamot oil—such as specific gravity, optical rotation and apparent linyl-acetate content. The best plan to detect the new adulterant consists in boiling the oil with alcoholic potash solution in a platinum dish until the liquid is evaporated, then calcine the residue, dissolve in distilled water, filter the solution, and test with silver nitrate for chlorides.—Chem. and Drugg., Aug. 31, 1901, 383.

Oil of Bergamot—Probable Adulteration with Oil of Lemon.—On examining a large consignment of oil of bergamot, Lyman F. Kebler found it to have an abnormally high optical rotation, namely $+28^{\circ}$ in a 100 Mm. tube, and, though in other respects responding well to tests, to contain a

corded rotation of genuine oil of bergamot is $+20^{\circ}$. While the addition of turpentine or orange oil might produce this abnormality, Mr. Kebler came to the conclusion that in this case it was probably due to the addition of about 20 per cent. of lemon oil.—*Amer. Journ. Pharm.*, Jan., 1902, 16.

Oil of Bergamot Leaves—Characters.—Dr. Salvatore Gulli states that, similarly to the oil of bitter orange leaves (known as oil of petit-grain), the oil has been distilled for several years in the district of Reggio Calabria from bergamot leaves. The yield is only about 150 Gm. from 100 kilos of leaves. The pure oil of the present season has a sp. gr. of about 0.871 to 0.873, an optical rotation from $+25^{\circ}30'$ to $+26^{\circ}$, and an ester-content, calculated as linalyl acetate, of about 32 to 34 per cent. It is soluble in 90 per cent. alcohol (1 : 1). It contains methyl anthranilate. The distillation of this oil is only carried on to a limited extent, and takes place between February and April, at the time of pruning, the amount of the production per year in this district varying according to the demand. The oil is rarely pure; turpentine is often distilled together with bergamot leaves, and very often leaves and young saplings of bitter orange are added in the distillation. The oil of bergamot leaves is put on the market as oil of petit-grain, or it is used to adulterate the oil of both bitter and sweet orange flowers. This adulteration, however, is easily detected, because it alters both the sp. gr. and the optical rotation, and increases the linalyl acetate percentage of pure oils.—*Chem. & Drugg.*, June 28, 1902, 995.

Citron Oil—Source and Characters.—Dr. Salvatore Gulli states that three kinds of citrons are cultivated in the district of Reggio Calabria and in Sicily, namely: (1) *Citrus Medica*, var. *Vulgaris* (Risso), known as "Cedro;" (2) *Citrus Medica*, var. *Gibocarpa* or *Citrea* (Risso), known as "Cedrino," and (3) *Citrus Medica*, var. *Rhegina* (Pasquale), known by the name of "Cedrone." The three varieties yield volatile oil by hand pressure, amounting to 300 or 350 Gm. from 1000 fruits, no distinction being made commercially between the oils from these different varieties, which are known in Sicily and at Reggio Calabria as "essenza di cedro or cedrino," in England as "citron oil," and in France as "essence de cédrat." The fruits are, however, used to a limited extent only for preparing oil, and the pure oil is rather rare on the market, owing to the fact that makers mix it with more or less lemon oil, and bitter or sweet orange oils. In the following table the author gives the results of an examination of three specimens of citron oil. No. 1 is pure oil made by the author last year from citron fruit; No. 2 is commercial citron oil, containing a great deal of lemon oil; No. 3 is a mixture of lemon oil, of bitter and sweet orange oil, and of lime oil, with small portions of citron oil, as the maker afterwards acknowledged.

1	0.8703	67°
2	0.858	+62° 13'
3	0.862	+78° 8'

The two characters—viz., sp. gr. and rotation—are enough to distinguish the difference between pure oil and commercial adulterated oil.—Chem. and Drugg., Jan. 4, 1902, 19.

Citron Oil—Confusion with Lemon Oil.—Schimmel & Co. call attention to the frequent confusion of the names of lemon and citron oils, these being by many considered synonymous names for identical oils. In view of a recent confusion of the two names in several formulas and independent of each other, they again explain the matter as follows:

Lemon Oil is obtained from *Citrus Limonum*, Risso., and is called in Italy "essenza di limone," in France "essence de citron," and in Germany "citronen oel" or "limonen oel."

Citron Oil, also called "cedro" or "cedrate oil," is, on the other hand, obtained from *Citrus Medica*, Risso. It is called in Italy "essenza di cedro, or cedrino," in France "essence de cédrat," and in Germany "cedro oel" or "cedrat oel."—Schimmel's Rep., April, 1902, 30.

Oil of Lemon—New Constituents.—From the terpenes obtained during the distillation of oil of lemon, H. E. Burgess has extracted a small quantity of a crystalline compound which yields an aldehyde having very different constants from those of citral. The boiling point of this new aldehyde is 80°–85° at 15 Mm.; its optical rotation, +0° 30'; refractive index, 1.4314 at 20°. It has an odor resembling that of coconut oil, and, on shaking the aldehyde with hydrogen peroxide and caustic soda solution, it is at once polymerized in a solid form and can then be recrystallized from alcohol. It forms an oxime melting at 35° C., and on oxidation with potassium permanganate it gives an oily acid; from the ammonium salt the silver, copper, and magnesium salts have been prepared and analyzed. Apparently the same aldehyde exists in orange oil, but was not found in the terpenes as in the case of lemon oil. Another crystalline substance was obtained which melted at 145° C. The crystals were sparingly soluble in alcohol, the solution having a marked blue fluorescence. Several combustions have been made of the recrystallized substance, which forms a crystalline dibromide and is oxidized to oxalic acid and carbonic acid.—Pharm. Journ., July 13, 1901, 33; from Proc. Chem. Soc., 17, 171.

Oil of Lemon—Characters of the Stearoptene.—Ernest Schmidt points out that the stearoptene of oil of lemon has been examined by numerous

chemists, the first of whom to assign a formula to the body was Mulder, who described it as $(C_2H_4O)_n$. It melted at 46° C., and sublimed at higher temperatures. Berthelot came to entirely different conclusions. He found that the body melted at 100° , and possessed the formula $C_{20}H_{30}O_9$. More recently Crismer has examined the body, and he described it as a compound of the formula $C_{10}H_{10}O_4$, and melting at 143° – 144° . Von Soden isolated crystalline needles which showed a blue fluorescence in alcohol, melting at 146° – 147° C. This appears to be identical with the compound isolated by Crismer, and with the limettin from lime oil isolated by Tilden and Beck. Theulier reported that he had isolated from the residue of the distillation in the preparation of terpeneless oil of lemon both this compound and an amorphous compound melting at 76° C. Lastly, Burgess recently claimed to have discovered two new substances, of which one melted at 145° C. and showed a blue fluorescence in alcohol. This body is clearly that previously described. The main, high-melting compound has now been isolated in quantity and thoroughly examined. It melts, according to the present author, at 147° C., and the name

Citrophen, given by Crismer, is retained for it. It does not correspond with the formula suggested by Crismer, but with that of Tilden for limettin, $C_{11}H_{10}O_4$. It contains two methoxy groups. A well-defined dibromide was obtained in yellow needles, which melted between 250° and 260° C. The citroptene appears to have the character of a lactone, or internal anhydride. From the residues other compounds were obtained, which are being examined. One of these is a phenol melting at 89° C.—Apoth. Ztg., Sept. 4, 1901, 619–621.

Essences of Lemon and Orange—Preparation from Terpeneless Oils.—The following formulas are recommended in the Trade Report of Heinrich Haensel, 1901 :

Essence of Lemon : Terpeneless lemon oil, 50 Gm. ; alcohol, 800 Gm. ; water, 150 Gm. Of this essence 150 Gm. are sufficient to flavor 50 Kg. of syrup.

Essence of Orange : Terpeneless orange oil, 6 Gm. ; alcohol (90 per cent.), 100 Gm. The product is sufficient for flavoring 50 Kg. of syrup.—Ph. Centralh., Aug. 15, 1901, 495 and 496.

Oil of Neroli—Physical and Chemical Constants.—Eug. Theulier has determined the physical and chemical constants of a large number of oils of orange flowers from different sources, all of them produced during the summer of 1901 in the manner usually adopted in the south of France—distilling the flowers with steam, without cohobation. They show some differences with regard to their quantitative composition and physical constants. The specific gravity, at 15° C., fluctuated between 0.869 and 0.8726, the average being 0.8709. The optical rotation was found between

the percentage of methyl anthranilate appears to be particularly subject to fluctuation; it was found to be from 0.42 upwards to 1.10, equal to 0.70 per cent. as the average of the 33 samples examined. For the determination of this ester, the method of Hesse and Zeitschel (see Proceedings, 1901, 827) was employed. The yield of oil was comparatively high, it fluctuated between 0.91 and 1.33 per cent. It was found that rainy weather during the harvesting season had an unfavorable effect, for on rainy days the yield was smallest, and was then considerably below the average (compare the observations of Jeancard and Satie, Proceedings, 1901, 827).—Schimmel's Rep., Oct., 1901, 37-38; from Bull. Soc. Chim., 1901, 762.

Similar tests have been made by Jean Gras at Cannes during the harvest of orange flowers of 1901. He noticed that the optical rotation of the oil was higher than in previous years, and that the average yield was also higher—from 0.870 to 1.500—average of 13 dates (May 23d to June 4th) = 1.13.—*Ibid.*, 38.

Orange Flower Water Oil—Percentage Yield and Characters.—A. Hesse and O. Zeitschel communicate some interesting observations made during a comparative examination of the processes for obtaining the aroma of orange blossoms employed in the south of France. As is well known, in the distillation of the blossoms a portion of the oil passes over into the water, which is used largely under the name of

Orange Flower Water. By exhausting this distillation water with ether, the authors have determined the quantity of the oil passing over into the water, and found that it represents about one-third of the total amount of oil from the blossoms. The specific gravity of this "water-oil" is 0.950 at 15°; optical rotation, $\alpha_D^{20} = +2^\circ 0'$; saponification number 72. The content of methyl ester of anthranilic acid is remarkably large, namely, 1.6 per cent., from which it may be concluded that the content of anthranilic acid ester in the total quantity of oil from orange blossoms is about 5 per cent. whereas in ordinary oil of neroli rarely more than 1 per cent. of this ester has been found.

Orange Flower Oil obtained by extraction of the blossoms with volatile solvents had the sp. gr. 0.907 at 15°; saponification number, 55.2; anthranilic acid ester content, 7.6 per cent., while

Orange Flower Oil Obtained by Enfleurage of the flowers (a process little used in practice) yielded but a small quantity of oil, whose constants were: Sp. gr. 0.909 at 15°; optical rotation, $\alpha_D^{20} = -80^\circ 34'$; saponification number, 58.2; anthranilic acid ester content, 5.2 per cent. In the saponified *oil of orange flower water*, phenyl-ethyl alcohol, phenyl-acetic acid and geraniol oil were detected.—Schimmel's Rep., April, 1901, 50; from Journ. f. prakt. Chem., 64, 245.

Oil of Orange—Inferior Quality.—L. van Italie has had occasion to investigate a sort of orange oil which, while having a good odor, varied in other respects from good normal oil. It was thick-liquid, yellow, faintly fluorescent, had a sp. gr. of 0.970 at 20°, an optical rotation of +43°20', at 20°, and only yielded about 48 per cent. of distillate at 175° to 180°, a final residue, amounting to 33.3 per cent. residue when distillation was pushed to the limit. The residue was sticky, nearly solid, of a light yellow color, slowly soluble in alcohol, acid in reaction—1 Gm. requiring 0.026 Gm. potassium hydroxide for neutralization of its alcoholic rotation—and was evidently a resin; but it is uncertain whether this resin was the result of spontaneous formation or a fraudulent addition. The original oil was soluble in all proportions in strong alcohol and in glacial acetic acid, and also formed a clear mixture with small quantities of petroleum ether; but on adding more petroleum ether, a light yellow, semi-solid mass separated from it.—Pharm. Centralh., Aug. 29, 1901, 538; from Pharm. Weekblad, 1901, No. 28.

Oil of Sweet Oranges—Chemistry.—Stephan communicates the results of his recent researches on the essential oil of sweet oranges. After separating over 90 per cent. of dextrolimonene from the oil by fractional distillation, he obtained about 3 per cent. of residue. This was a liquid of oily consistence, which when shaken with sodium bisulphite, yielded a crystalline compound. This was washed with alcohol and ether, and then decomposed in the usual manner by means of sodium carbonate. The resulting liquid, which is separated from the aqueous layer, was purified by rectification. On further examination it proved to be normal decylic aldehyde, $C_{10}H_{20}O$. The portion which did not combine with the bisulphite was then warmed with alcoholic potash in order to saponify the esters present. From these caprylic acid was separated. The principal alcohols present proved to be normal nonylic alcohol, linalol and terpinenol. Stephan denies that there is either citral or citronellal present in oil of orange, and considers that that found by both Semmler and Parry was due to the presence of lemon oil in the orange oil examined. Stephan points out that linalol was discovered first in oil of orange by E. J. Parry, but omits to mention that this chemist also found butyric acid and the immediately higher homologues of the acid present in the form of esters. Parry also found methyl anthranilate in the oil, an observation since confirmed by Schimmel's chemists, but to which no reference is made in the present paper, which entirely omits mentioning the presence of this body in the oil.—Chem. & Drugg., Sept. 14, 1901, 466; from Journ. f. prakt. Chem., 1901, 525.

Aniseed Oils and Anethol—Examination of Commercial Specimens.—Dr. George R. Pancoast and Lyman F. Kebler review the characters of distinction of the aniseed oils and of anethol, from which it appears that the physical characters of the oil of star anise are about the same as those

only those of a more scientific character are met. Kerosene seems to have been used largely for some time, but the authors have never met with this. They have recently examined a number of samples of the aniseed oils offered as pure, with the following results :

Source.	Specific Gravity.	Optical Rotation.	Congeeing Point.	Solubility equal vol. al.
1. Russian	0.9838 at 17° C.	+3° 50'	15° C.	Soluble.
2. Russian	0.9893 at 20° C.	—4° 59'	18° C.	Soluble.
3. Tonquin	0.9834 at 17° C.	—1° 30'	17° C.	Soluble.
4. Star anise	0.9648 at 17° C.	—1° 27'	15° C.	Soluble.
5. Star anise	0.9870 at 17° C.	+0° 58'	16° C.	Soluble.
6. Star anise	0.9822 at 17° C.	—1° 53'	15.5° C.	Soluble.
7. Star anise	0.9821 at 17° C.	—1° 31'	14.5° C.	Soluble.
8. Star anise	0.9832 at 17° C.	—1° 44'	14° C.	Soluble.
9. Star anise	0.9832 at 17° C.	—1° 44'	14° C.	Soluble.

Oils number one and two have undoubtedly been tampered with. The disturbed optical rotation of No. 1 is probably due to added oil of fennel, or some of its derivatives. What the disturbing factor of No. 2 is, the authors are unable to conjecture. Number 8 is also abnormal, due probably to the same added impurities as No. 1, or possibly added star anise leaf oil, which has a specific gravity of 0.9878 at 15° C. and an optical rotation of +1 degree. Its anethol content is small, and the congealing point correspondingly low. It has been called "Liquid star anise oil," and has no practical value, except as an adulterant. Oils are occasionally met with, having a low congealing point, yet are not adulterated. These are the "Flower Oils." They are obtained from a mixture of natural and artificially-ripened seeds; *i. e.*, the umbels are gathered before the fruit is all ripe, so as to hasten the ripening of the green seeds. Such oils cannot be considered equal to an oil made entirely from prime seed. With regard to

Anethol, the authors observe that the Ph. Germ. describes it as a colorless, highly refractive liquid, of a pure anise odor, and of intensely sweetish taste; specific gravity at 25° C. 0.984 to 0.986; melting point 20–21° C., boiling point 232 to 234° C., and must form a clear solution with two parts of alcohol.

Several samples examined by the author yielded :

Specific Gravity.	Optical Rotation.	Congeeing Point.	Boiling Point.
A. 0.9895 at 20° C.	0° 0'	17° C.	210–235° C.
B. 0.9896 at 20° C.	—1° 30'	20° C.	220–235° C.
C. 1.0525 at 15° C.	—2° 18'	not at 5° C.	228–245° C.
D. 0.9870 at 20° C.	+5° 22'	20° C.	229–236° C.

All are soluble in an equal volume of alcohol. A and B are of fair quality, but do not comply strictly with the usual physical data for anethol. —Proc. Pa. Pharm. Assoc., 1901, 171–175.

Anise, Clover and Cinnamon Oils—Physical Constants and Constituents of Commercial Samples.—Edwin Dowzard has examined thirty commercial samples of anise oil, eleven of clove oil, and eight of cinnamon oil, and gives the results of his determination of their specific gravities, optical rotation, solubility, and characteristic constituents, in a tabulated statement which must be consulted in the original.—Chem. & Drugg., June 21, 1902, 961.

Oil of Cloves—Constituents.—Schimmel & Co. have again subjected the constituents of oil of cloves to investigation with the principal purpose of isolating and examining the methyl-n-amyl ketone. This ketone, freed from furfural by treatment with permanganate solution, distilled at 151°–153° C., had a sp. gr. 0.8223 at 15° C., showed no optical rotation, and its identity with the ketone present in Ceylon cinnamon oil (which see) was established by the melting point of its semicarbazone, which was found to be 122°–123° C. When the fractions of clove oil distilled at 200°–240° C. were saponified, benzoic acid was isolated in considerable quantity. This is assumed to be present in the oil in the form of a methyl ester. No terpenes were detected in the corresponding fractions.—Schimmel's Rep., April, 1902, 24.

Eugenol—Estimation in Oil of Cloves.—A. Verley and F. Bölsing find that the method of Umney for the determination of eugenol in oil of cloves, which consists in its abstraction by means of 10 per cent. alkali lye, yields results which are too high because of the partial solution of the associated terpenes; while that of Thoms, which is dependent on the conversion of the eugenol into benzoate, gives figures which are too low. They recommend as accurate a method which depends upon the quantitative esterification of eugenol by acetic anhydride in the presence of pyridine, the reaction between the phenol and acetic anhydride being greatly accelerated by the pyridine under increase of temperature and formation of a neutral acetate of pyridine. To carry out the estimation a "mixture" of 120 Gm. acetic anhydride and 880 Gm. pyridine is prepared, these two bodies not reacting upon each other in the absence of water, while in the presence of water pyridine acetate is formed. On addition of alkali, the pyridine acetate is decomposed, alkali acetate being formed, and pyridine liberated, neither of these bodies reacting with phenolphthalein. Upon this depends the method of titration employed, the process being conducted as follows: From 1 to 2 Gm. of oil of cloves are introduced into a flask of 200 Cc. capacity together with 25 Cc. of the "mixture." Heat is applied in a water-bath during 15 minutes, 25 Cc. of water are added, and, after cooling, the uncombined acetic acid is titrated

eugenol—each molecule of absorbed acetic acid corresponding to one molecule of eugenol.—Pharm. Ztg., Dec. 14, 1901, 992; from Ber. d. D. Chem. Ges., 1901, 3359.

Oil of Ceylon Cinnamon—Composition.—Schimmel & Co. observe that in addition to cinnamic aldehyde as the principal constituent of true oil of Ceylon cinnamon, only eugenol and phellandrene and have been determined with certainty up to now. They have now instituted a thorough examination on a large quantity of this oil of undoubted source and quality, and have determined the following additional bodies: Methyl-n-amylketone ($\text{CH}_3\text{CO}\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_3$); pinene ($\text{C}_{10}\text{H}_{16}$); furfurol ($\text{C}_4\text{H}_2\text{O}\cdot\text{CHO}$); cymene ($\text{C}_{10}\text{H}_{14}$); benzaldehyde ($\text{C}_6\text{H}_5\cdot\text{CHO}$); nonylic aldehyde ($\text{C}_9\text{H}_{18}\text{O}$); hydrocinnamic aldehyde ($\text{C}_6\text{H}_5\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{CHO}$); cumic aldehyde ($\text{C}_{10}\text{H}_{18}\text{O}$); linalol ($\text{C}_{10}\text{H}_{18}\text{O}$); linalyl isobutyrate ($\text{C}_{18}\text{H}_{32}\text{O}_2$); and caryophyllene ($\text{C}_{15}\text{H}_{24}$).—Schimmel's Rep., April, 1902, 14-19.

Oil of Cassia—Adulteration with Kerosene.—Lyman F. Kebler states that it is not uncommon to find oil of cassia adulterated with kerosene to the extent of 20 per cent. in the original package coming from China. In one case he found the quantity of adulterant so great that a portion of the kerosene floated on top of the oil, oil of cassia being capable of mixing clear only with a limited portion of the hydrocarbon. In recent years it has become the practice to purchase oil of cassia largely on the basis of the percentage of cinnamic aldehyde content, a practice which doubtless has the effect of minimizing this gross adulteration.—Amer. Journ. Pharm., Jan., 1902, 16.

Calamus Oil—Constituents.—In 1899 the chemists of Messrs. Schimmel & Co. detected in calamus oil a compound melting at 167°C ., which they now regard as being doubtless identical with a body of the formula $\text{C}_{15}\text{H}_{26}\text{O}$, found by H. v. Soden and W. Rojahn in Galician calamus oil. Recently (Berliner Berichte, 1901, 1021) H. Thoms and R. Beckstroem examined calamus oil originating from the factory of Schimmel & Co. and obtained this compound from the highest boiling portions of the fractionation. After repeated recrystallization from alcohol, it showed a melting point of $166^\circ\text{--}167.5^\circ\text{C}$., and the figures obtained on elementary analysis corresponded with those above mentioned. They further more obtained from the mother liquor from which these crystals separated a second well-defined crystalline substance, melting at 60°C ., which was found to be

Asarone. This is interesting because so far this body has only been found in the oil of *Asarum europaeum*, L., and in matico oil, and particularly so because according to Thoms and Beckstroem asarone is connected with the fragrant principle of calamus oil.—Schimmel's Rep., Oct., 1901, 10-11.

Ceylon Cardamom Oil—Constants, etc.—Schimmel & Co., who formerly distilled "Ceylon cardamom" oil from the fruits of *Elletaria Cardamomum* var. β ., announce that they now distil the oil designated in their price list as "Ceylon cardamon oil" from the seeds of another species from which the pericarp has been removed. This differs from the oil previously supplied, and has approximately the following constants: Sp. gr. at 15° C., 0.9336; optical rotation, $+24^{\circ} 15'$; saponification number, 109. The new oil makes a clear solution with 3 parts by volume of 70 per cent. alcohol.—Schimmel's Rep., October, 1901, 14.

Oil of Canada Snake Root—Composition.—Some years ago, Fr. B. Power had examined the volatile oil distilled from the underground portions of *Asarum canadense*. The progress made since then in the knowledge of the constituents of essential oils, as also in the methods of examination, has induced the author to undertake a further careful examination, jointly with Fr. B. Lees, with results which prove the oil to be a more complicated body than the previous examination would lead one to believe. The authors have now found the following constituents: (1) a phenol, $C_9H_{12}O_2$; (2) pinene, clearly as a mixture of two optically active modifications; (3) d-linalol; (4) l-borneol; (5) l-terpinol; (6) geraniol; (7) eugenol-methyl ether; (8) a blue oil of indefinite composition, consisting of oxygenated compounds of alcoholic character; (9) a lactone, $C_{14}H_{20}O_2$; (10) palmitic acid; (11) acetic acid, and (12) a mixture of higher and lower fatty acids. The content of eugenol-methyl ether in the original oil amounted to 36.9 per cent.; the ester content calculated as $C_2H_5O_2 \cdot C_{10}H_{17}$, to 27.5 per cent.; the total content of alcohols, $C_{10}H_{18}O$, was found to be 34.9 per cent., from which it follows that about 13.3 per cent. alcohols are present in the non-esterified state. As the oil contains about 2 per cent. of pinene, the high-boiling constituents, the blue oil, etc., would represent a little less than 20 per cent.—Schimmel's Rep., April, 1902, 63; from Journ. Chem. Soc., 1902, 59.

Citronella Oil—Cultivation of the Plants and Adulteration in Ceylon.—A correspondent of the *Tropical Agriculturist* calls attention to the enormous extent of land under citronella grass in the Southern province of Ceylon. There is no doubt, he says, that this hardy grass, growing as it does without any special attention, has spoiled the people for better cultivation. In these citronella districts the abortive attempts to grow cocoanuts, coffee, cocoa, &c., only go to prove that even if these economic products are suited to the districts, they will not tolerate the kind of treatment that is meted out to them by the careless citronella planter. The wholesale adulteration of citronella oil by kerosene has been the downfall of the Ceylon trade in the oil, and it is still practiced. The dodge now employed is to pour the kerosene over the grass when it is ready to be operated on by steam, and distil the vegetable and mineral oils together. In spite of the fact that it is periodically said the distillation does not pay,

Citronella Oil—Commercial Quality.—Ernest J. Parry observes that, apart from the general analysis of oil of citronella, the great bulk of the oil sold on the London market is examined in order that it may be certified as passing the so-called "Schimmel's test." Pure oils of commerce give somewhat different results with this test, some being quite soluble in 80 per cent. alcohol, and others although quite soluble in 3 or 4 volumes of the alcohol, become slightly turbid on the addition of 10 volumes of the solvent. Occasionally one has to decide as to what constitutes "slight turbidity" in this respect. In general he finds that the citronella oils (that is, the pure oils), with low sp. gr. are those which give a perfectly clear solution, whilst those with a high sp. gr. often give a slight turbidity when the full 10 volumes of alcohol are added. In cases where any possible doubt can arise as to what is the limit that this turbidity may assume, without the oil failing to pass the test, the use of alcohol of slightly higher strength will be found of service. With pure oils the turbidity almost, if not quite, disappears when the alcohol is increased to 81–83 per cent., whilst if even very small quantities of petroleum are present, there is practically no change by using alcohol up to 85 per cent. strength. It has been shown that the high gravity oils usually contain more methyl-eugenol than the low gravity samples; but this would not account for the lower solubility in alcohol. It is probable that this is due to the greater preponderance of sesquiterpene in the high gravity oils.—Chem. & Drugg., July 27, 1901, 142.

Citronellol—Natural Occurrence in Java Citronella Oil.—It has been a mooted question, heretofore, whether citronellol was a natural constituent of citronella oil along with the geraniol known to be present. Schimmel & Co. have now undertaken to investigate the subject, and have found that citronella oil from Java does contain citronellol as a natural constituent, while in Ceylon citronella oil they were unable to find it. The citronellol obtained corresponds in all essentials with that present in geranium oil, with the single exception that it is dextrogyre ($+2^{\circ} 7' - 2^{\circ} 32'$), while the citronellol of geranium oil is laevogyre ($-1^{\circ} 40'$).—Schimmel's Rep., April, 1902, 20–22.

Oil of Convallaria Leaves—Preparation and Characters.—According to Hænsel's Report for 1901, the leaves of *Convallaria majalis* yielded about 0.058 per cent. of volatile oil when subjected to the action of steam. This oil is at first bright green, but on exposure to the air soon assumes a greenish brown color. Its odor is agreeably aromatic, its taste spicy and burning, its reaction acid. It is solid at the ordinary temperature, showing crystalline structure, but melts at 40.5° , and begins to boil at 120° C.; is easily soluble in alcohol, ether, and warm alcoholic potas-

sium hydrate solution. Upon blotting paper it leaves a fatty stain which does not disappear completely on exposure, and it is evidently composed of a liquid odorous portion, and of a solid portion which is obtainable in the form of white glistening leaflets by crystallization from absolute alcohol. The crystalline body is only faintly odorous and melts at 61° C. The firm of Heinrich Hænsel have also obtained the

Volatile Oil of Olive Leaves, hitherto unknown, to the amount of 0.04 per cent. of the dried leaves. The oil has an acid reaction, a yellow color, and a salve-like consistence, melting at 26.5° C. It has a pleasant odor and a strong aromatic taste.—Pharm. Centralh., Aug. 15, 1901, 495-6.

Oil of Copaiba—Adulteration and Detection of Oil of Gurjun Balsam.—Lyman F. Kebler observes that while it is a familiar fact that copaiba is sometimes adulterated with gurjun balsam, it is not so well known that the volatile oil is adulterated with the oil of gurjun balsam. A good test, which he recommends confidently, is the following: Into the bottom of a test-tube place 1 Cc. of glacial acetic acid (99.5 per cent.), add four drops of pure concentrated nitric acid, and mix well, then add four drops of the suspected oil to the mixture, allowing it to float on top; if oil of gurjun balsam is present, a reddish or purplish zone will be developed between the layer of oil and the acid mixture in a few minutes. No reaction occurs if this oil is pure.—Amer. Journ. Pharm., Jan., 1902, 16.

Eucalyptus Oils—Characteristic Constituent in Sorts that have a "Peppermint" Odor.—In a paper communicated to the Royal Society of New South Wales, H. G. Smith describes the constituent to which the peppermint odor observed in many eucalyptus oils. He mentions that the first eucalyptus oil obtained was distilled by Dr. White in 1788, at Sydney, and, owing to the great resemblance between the oil and that obtained from the peppermint, *Mentha piperita*, he named the tree *Eucalyptus piperita*, from which he had obtained the oil, the "Peppermint Tree." Since then many other species of *Eucalyptus* have been found to possess the peppermint odor, and are generally known as "peppermints." The constituent to which the odor is due has now been isolated. It occurs in greatest amount in the oil obtained from the leaves of *E. dives*, next in that of *E. radiata*, and in fair amount in the oils of several other species. It is usually found in those eucalyptus oils in which the principal terpene is phellandrene (see Proceedings, 1900, 639), although this is not always so, but generally there is an almost entire absence of eucalyptol in those oils in which it occurs most abundantly. The crude oil of *E. dives* was taken for the preparation of this peppermint constituent. This constituent is not menthone, and is probably a new ketone; a molecular determination gave 155, so that probably its formula may eventually be found to be $C_{10}H_{18}O$.—Pharm. Journ., Jan. 11, 1902, 21; from Nature, 65, 192.

ments of Henry G. Smith have shown that a sesquiterpene, for which he proposes the name

Aromadendrene, occurs in many eucalyptus oils, and that it is this constituent that gives the pink coloration of eucalyptus oil when testing for eucalyptol with phosphoric acid. In the oil of *E. hamastoma* the sesquiterpene occurs in large amount, over 50 per cent. of the crude oil distilling above 255° C. It is also present in quantity in the oils of several other species. Crystallized chemical products could not be obtained with it by the methods used. It is characterized by a range of five color reactions which it gives with acids and with bromine when dissolved in glacial acetic acid. When the vapor of bromine is allowed to fall into the tube containing such a mixture, immediately it touches the liquid a crimson color is formed, quickly changing to violet, and finally to a deep indigo-blue. It boils under atmospheric pressure at 260°-265° C., and has a specific gravity 0.9249 at 19° C., as obtained by repeated fractional distillation, finally over sodium. Combustion results give the terpene formula, and a vapor density determination showed it to be a sesquiterpene.—Chem. News, Jan. 3, 1902, 3.

Aromadendral—A New Aldehyde in Eucalyptus Oils.—H. G. Smith has isolated a new aldehyde from certain eucalyptus oils, which he has named "aromadendral." It occurs in greatest amount in the true "boxes," *Eucalyptus hemiphloia*, *E. albeus*, *E. woollsiana*, etc. The least amount being found in oils rich in cineol, it is suggested that the natural cineol may be derived, directly or indirectly, from this aldehyde. The boiling point of aromadendral is 210° C., its mean specific gravity is 0.9477, and its composition corresponds to the formula $C_{10}H_{14}O$. The pure aldehyde appears to yield cineol as one of the products of oxidation by an alkaline solution of potassium permanganate, but "aromadendric acid" is formed if the oxidation is effected by means of potassium bichromate with sulphuric acid. By the action of sodium on an alcoholic solution of aromadendral, an odorous oil is obtained, which is probably the alcohol, "aromadendrol," corresponding to the new aldehyde.—Pharm. Journ., July 13, 1901, 34; from Proc. Royal Soc. N. S. Wales.

Hyssop Oil—Oxygenated Constituents.—According to Heinrich Haenssel's April Report (1902), the oxygenated components of hyssop oil amount to 72 per cent. of the crude oil, which they represent in a concentrated form both as regards odor and taste. Its specific gravity is higher, its color pale green and brilliant.—Pharm. Ztg., April 19, 1902, 306.

Oil of Jasmine Flowers—Methyl Anthranilate a Natural Constituent.—E. Erdmann contradicts the statement of A. Hesse, that methyl anthranilate is present only in the oil of jasmine flowers obtained by *enfleurage* and not in that obtained by extraction, and he claims also to have been

the first to communicate its presence in the oil, as well as the other constituents—benzyl acetate, benzyl alcohol and linalool, mentioned in Hesse's recent paper (see Proceedings, 1901, 822). Furthermore, he regards it out of the question that a considerable quantity of jasmine oil is developed in the picked flowers during the enfleurage period, Hesse claiming that this amounts to nine times as much as is contained in the fresh-picked flowers. He also appears to disagree with the suggestion of Messrs. Schimmel & Co. that possibly oil-constituents might develop in the rose flowers after gathering, to which the latter observes that inasmuch as Erdmann himself has as yet made no experiments whatever on this subject, his objections do not carry any weight.—Berl. Berichte, 1901, 2281, and Schimmel's Rep., Oct., 1901, 33.

In continuation of his researches on the development of the essential oil of jasmine flower, A. Hesse shows again, with "jasmin pur" supplied by Tillet under guarantee of purity, that methyl anthranilate is not present in demonstrable quantity in the oil obtained by extraction from fresh jasmine flowers. For this reason Hesse believes that he must maintain his opinion, contrary to Erdmann's above criticism, that this ester is formed during the enfleurage process. He considers that this possibly can be explained by the decomposition of a nitrogenous compound, a number of long known observations favoring such a possibility. As a matter of fact, the author's tabulated experiments show that 1000 kilos of fresh jasmine flowers do not yield a larger quantity of oil when submitted to the process of extraction and distillation, than the quantity still present in the waste flowers which remain after treatment of the same quantity of flowers by enfleurage. If these results clearly show that during the enfleurage process essential oil is formed in the picked flowers, the question remains to be answered, wherefrom do indol and methyl anthranilate subsequently originate, bodies which at first are evidently not present in the fresh flowers? When the fresh flowers are stored in an open room, no increase in the essential oil could be detected; the oil distilled from them, however, contained anthranilic acid ester, but no indol.—Schimmel's Rep., April, 1902, 44; from Berl. Berichte, 34 (1901), 2916.

In a reply to the preceding, Erdmann holds that the products obtained by the two methods must be considered as two different fractions of one and the same oil. He has nothing to say against the supposition that the odoriferous substances represent occasionally the product of decomposition of complex bodies, but what only appears to him incredible is Hesse's first opinion, that the increase in the odoriferous substances of the jasmine flower is due to a process of vegetation which still continues after the flowers are picked. Contrary to Hesse, Erdmann has succeeded in isolating and crystallizing blue fluorescent methyl ester of anthranilic acid from an oil obtained in 1898 from jasmine flowers by the extraction process.—*Ibid.*, p. 45; from Berl. Berichte, 35 (1902), 27.

Oil of Lavender—Raising of Ester-Content by Means of Benzoic Acid.—Schimmel & Co., who have previously reported on adulterants employed to raise the ester-content of lavender oils, now call attention to an adulteration of such oil with 1.5 per cent. of benzoic acid for this purpose. While they consider this adulteration to be merely an attempt, the selection of benzoic acid is ingenious, since its addition does not affect the physical constants of the oil, and was only suspected on account of the low acid number of the sample.—Schimmel's Rep., April, 1902, 46.

Oil of Lavender—Solubility in Diluted Alcohol, Ph. Germ.—In consequence of complaints that oil of lavender supplied by them failed to form a clear solution with three parts of diluted alcohol (Pharm. Germ. = 68 to 69 per cent. by volume), Messrs. Schimmel & Co. have tested a series of a good quality of lavender oils, with results as follows: A lavender oil which had the ester content required by the Pharm. Germ. (29 to 30 per cent.) makes a clear solution with 3 to $3\frac{1}{2}$ volumes of 68 per cent. alcohol, and with 3 volumes of 69 per cent. alcohol. But the first-named solution with a large excess of alcohol shows immediately an opalescence, whereas the solution in 69 per cent. alcohol at first remains clear when more solvent is added. This, however, does not happen with lavender oils having a higher ester-content (about 40 per cent.). In this case $3\frac{1}{2}$ to 4 volumes of 68 per cent., and 3 to $3\frac{1}{2}$ volumes of 69 per cent. alcohol are required to make clear solutions. The solution in 68 per cent. alcohol very soon acquires a fairly strong opalescence, and retains this even when more alcohol is added. The solution in 69 per cent. alcohol remains clear, but in this case opalescence appears immediately upon adding more alcohol, contrary to what happens with lavender oils less rich in esters. It is therefore quite possible that the lavender oil, according to the strength of the diluted alcohol and the ester-content of the oil itself, may not answer the requirements of the Pharmacopœia, and this will always be the case if the test is made with dilute alcohol which has the lowest alcohol-content allowed. Such occurrence would not be possible if the Pharm. Germ. specified a dilute alcohol of quite definite strength, as, for example, 70 per cent. by volume. With $2\frac{1}{2}$ to 3 volumes of such alcohol all lavender oils make clear solutions.—Schimmel's Rep., Oct., 1901, 35–36.

Oil of Pennyroyal—Gross Adulteration.—Prof. Edward Kremers calls attention to a gross adulteration of oil of pennyroyal obtained by his assistant, Mr. F. W. Alden. Its specific gravity was 0.960, whereas the U. S. P. requires 0.93 to 0.94. Besides being a thick liquid it was so dark that the angle of rotation could not be determined. Systematic investigation showed this so-called "discolored pennyroyal oil" to be nothing more or less than a solution of rosin in oil of turpentine, flavored with some pennyroyal oil.—Pharm. Era, Aug. 1, 1901, 124.

Oil of Peppermint—A Michigan Peppermint Still.—R. H. Denniston

observes that, although peppermint raising and distillation in Michigan is now carried on principally by large growers, there are a number of small private stills scattered throughout the southeastern part of the state, one of which he describes, with illustrations, as seen by him in 1899. The still consists of a large cylindrical wooden tank from 6 to 10 feet in diameter, and 6 to 8 feet high. The herb is packed into this tank by a man tramping it down with his bare feet, and, the wooden cover being clamped on, steam is forced through the mass from which it passes into the cooling pipes laden with the oil. These cooling pipes consist of a series of tin pipes running back and forth, over which cold water trickles from an elevated tank. The distillate is collected in a pail, provided at the bottom with an S-tube to carry off the water, and in which the oil accumulates and is dipped out from time to time. The daily output of one of these stills is from 30 to 40 pounds of oil. The plants are cut when flowering—usually late in August or early in September—are slightly dried and then stored in an open shed until the oil is extracted.—Pharm. Rev., March, 1902, 108.

Oil of Peppermint—Commercial Manipulation.—In an interesting paper on oil of peppermint, written with particular reference to the requirements of the Phar. Germ., IV, P. Welmans points out that the commercial oil is manipulated by shrewd dealers and distillers so as to conform to the solubility test of that standard, which contemplates the use of Mitcham oil, the cheaper American oils being used for this purpose. This test demands that oil of peppermint shall form a clear solution with from 3 to 5 parts of diluted alcohol (60 per cent. by weight), its specific gravity being given as 0.90 to 0.91. The only peppermint oil that conforms in delicacy of aroma to Mitcham oil is the French oil, but up to 1890-93 French manufacturers were unable to supply an oil that would respond to the solubility test. In 1894, however, the French manufacturers appeared to have learned "the trick of the German manufacturers," and were able to supply an oil that, possessing the delicate aroma of Mitcham peppermint oil, conformed to the solubility test of the Ph. Germ., III, which is in 4-5 parts of diluted (60 per cent.) alcohol. This "trick" in so far as the oils of German commerce is concerned, consists in fractionating American peppermint oil and adding a portion of extra strong Mitcham oil in order to attain the requisite degree of solubility. The author's investigations demonstrate that the quality of oil of peppermint supplied depends on the integrity of the dealer, and is largely a matter of confidence. It is given to few to be sufficiently expert to distinguish the different grades of oil from each other by their aroma. In order, however, to ascertain in what respect it may be possible to distinguish between the different commercial sorts on the basis of physical constants, the author procured eight different specimens, numbered in the appended table in accordance with the following description of source :

1. Mitcham oil, designated as "Mitcham doubly rectified."
2. The same, from a different manufacturer.
3. Oil of Peppermint rectified—American oil, rectified in England.
4. Essence de Menthe—French peppermint oil from Grasse.
5. Oil of Peppermint of German Commerce, distilled from Mitcham plants cultivated in America and rectified in Germany.
6. Oil of Peppermint, German, distilled from leaves, and terpeneless.
7. Oil of Peppermint, American, designated as "Mitcham concentrated."
8. Oil of Peppermint, American, designated as "Mitcham-Harmington," triple rectified.

The commercial value of 1, 2 and 4 is given at 60 M.; of 5 at 35 M.; of 6 at 25 M.; of 7 at 21 M.; of 3 at 20 M.; and of 8 at 13 M. (per kilo? Rep.). Concerning the portion of oil mentioned in the table as passing over at temperature of 200° C., the author mentions that this experiment was undertaken in order to determine the amount of water contained in the oil—water being formed in all suitable oils as the result of oxidation, its quantity being augmented with the increase in age. Obviously the presence of water must influence the sp. gr. of the sample, and this was exemplified in the author's experience in the case of the French oil (No. 4), the sp. gr. of which increased in the course of one year from 0.903 to 0.910 at 15° C. The table shows that all the oils yielded only a few drops of distillate below 200° C. The oils Nos. 1-5 and 8 conformed to the required conditions as to solubility in diluted (60 per cent.) alcohol, while the oils Nos. 1-6 are within the official limits of specific gravity. The oil No. 8 is characterized by its strongly bitter taste, and is evidently Japanese peppermint oil.

Oil of Peppermint.	1	2	3	4	5	6	7	8
Color.	Nearly colorless.	Nearly colorless.	Nearly colorless.	Colorless.	Colorless.	Colorless.	Colorless.	Lemon yellow.
Specific gravity.	0.906 at 15° C.	0.906 at 15° C.	0.9035 at 13° C.	0.9000 at 20° C. 0.903 at 15° C.	0.9064 at 14° C.	0.908 at 20° C. 0.911 at 15° C.	0.912 at 15° C.	0.921 at 15° C.
Polarization in a 100 Mm. tube.	-23.4°	-23.05°	-26.9°	-22.0°	-24.15°	-19.°	-16.3°	-26.5°

Amount distilling over below 200° C.

From each of the 8 oils only a few drops, composed mainly of water.

Residue after distillation	Light yellow.	Lemon yellow.	Lemon yellow.	Nearly colorless.	Yellow.	Light yellow.	Light yellow.	Brown
Soluble in diluted alcohol (Ph. G. 60 p. c.).	In 4 p.	In 5 p.	In 5 p.	In 3 p.	In 4 p.	In 6 p. faintly opalescent.	In 6 p. strongly opalescent.	In barely 3 p.

—Pharm. Ztg., July 3, 1901, 532.

Oil of Peppermint—Color Reactions.—It is mentioned in the literature that oil of peppermint is capable of producing with certain reagents various color reactions. Then with concentrated sulphuric acid, or with chloral—particularly if the latter contains free HCl—a red-violet color is produced, while nitric acid, added to the oil in the proportion of 1 drop to 50, gradually produces a blue to blue green color, and glacial acetic acid, in the proportion of 1 vol. to 2 vols. of the oil, produces after a time a magnificent blue color when viewed by transmitted light and a lively copper-like fluorescence in reflected light. Gildermeister attributes these color reactions to an oxidation process induced by the introduction of atmospheric air, and finds that these various colorations are produced most pronouncedly by American peppermint oil, only faintly by Mitcham oil, and not at all by Japanese oil. P. Welmans' recent experiments confirm these observations in so far as the differentiation of the several kinds of oil is concerned, and add that the French oil of peppermint in this respect comports itself like Mitcham oil. But he has made the further observation that the same oil does not always give the same reaction, or one of equal intensity, and, supported by the results of numerous experiments, has arrived at the conclusion that these color reactions are not due to the oxygen introduced by the air, but to the presence of chlorine in the air of the laboratory or otherwise introduced. Moreover, chlorinated compounds in peppermint oils are not absolutely excluded. It remains a fact that in the presence of chlorine the reaction is produced very promptly. The chloracetic acids, mono- di- and tri-, produce beautiful reactions very rapidly, as does also acetic acid to which a little chlorine water has been added, the colors produced varying between pure blue, deep green and violet, according to the degree of chlorination. The author finds that Japanese peppermint oil shows very little reaction even with the strongly chlorinated acids. It assumes at most an olive-green color with faint red fluorescence.—Pharm. Ztg., July 3, 1901, 533.

Oil of Peppermint—Color Reaction with Carbolic Acid, etc.—P. Fiora states that when oil of peppermint is added to an excess of phenol a greenish-blue color is developed after a time, which disappears on heating but reappears with equal intensity on cooling. He regards this reaction as characteristic for phenol, neither creosote, guaiacol or resorcin, nor sodium phenolate giving it.—Pharm. Ztg., July, 1901.

Referring to this observation of Fiora, P. Welmans, believing the color reaction to be due to an oxidizing process, doubts the correctness of Fiora's assumption. On repeating the experiment with acid. carbol. puriss., designated by the manufacturer as "phenol absolut," he was unable to obtain the color reaction mentioned; but on adding to the phenol a drop of nitric acid free from chlorine, a strong blue color was immediately developed, exhibiting a coppery fluorescence by reflected light, while a deep green coloration was produced on heating. Further-

more, in view of this effect of nitric acid, Mr. previously expressed opinion (see preceding at: peppermint oil with nitric acid was probat: chlorine. He finds, however, that decided' is produced when 5 vols. of peppermint solution of iod-mercuric chloride (25 I, acetic acid and acetic ether to make 1 lit standing, remains a long time, and exhi Pharm. Ztg., July 24, 1901, 591.

Oil of Peppermint—Adulteration wi Kebler several years ago met with a lot c terated with oil of turpentine to the ex' attention to it because of the frequent this high percentage of added oil of the sp. gr. below the lower official lir was established by fractional distillat the temperature of 180° C. was reac treme limit of hydrocarbons natu' remainder was the adulterant in little material, having a boiling po Jan., 1902, 17.

Terpeneless Peppermint Oils— sel's Report for 1902, terpeneles a sp. gr. of 0.922, a rotatory & parts of 70 per cent. alcohol, Pharm. Ztg., April 19, 1902, :

Otto of Roses—Difficulty t of Purity.—A specimen of v roses, presented to the Mus Sawyer by the firm of Slavi incentive to a very inter and discussed at a meet course of his remarks, observations that have less familiar, and partic tions which have been this oil, as well as of v made by the author whose firm has plant: the mountain air and roses, that distilled more delicate fragr plantations yield the demand, whic

chase otto distilled by small cultivators, and thus all the otto, unless bulked, cannot possibly be exactly of the same quality. The kind of roses cultivated, the climatic conditions under which they are grown, the character of the soil, and the apparatus and method of distillation, all have their influence on the product. But the integrity of the manufacturer is regarded by Mr. Holmes to be the most important point, for there is at present no absolutely chemical or physical means of ascertaining the amount of geraniol, or Indian oil of geranium, that may be added by unscrupulous manufacturers or vendors, either in the still before distillation or to the oil after distillation. The test of genuineness, dependent on a definite percentage of stearoptene and the temperature at which the oil solidifies, is also fallacious; for the stearoptene can be easily supplied to cover the deficiency resulting from adulterations with geranium oil. Mr. Holmes considers it quite probable that the flowers of the white rose, *Rosa alba*, are employed for this purpose. This is known to be cultivated on Bulgarian plantations, and experiments have shown the oil obtained from them to have little odor, but much more stearoptene than do the highly odorous red Bulgarian roses. This stearoptene, when perfectly purified, is absolutely inodorous, and consequently mitigates the odor of the otto to the extent of its presence. With regard to the odor itself, even of absolutely pure samples of oil of rose, this must necessarily vary according to the kind of roses used in the preparation. Such distinctions must be quite apparent between the ottos of such roses as, for instance, the French variety of *Rosa centifolia*, and the buckeye cabbage rose of English gardens; or the *Rosa damascena*, the hybrid rose. General Jacqueminot, the Maréchal Niel, the Austrian briar rose, etc. Some of these roses, Mr. Holmes suggests, might be cultivated for the otto in certain localities in England, which he points out as being suitable for this industry. Mr. Holmes also refers to the "synthetic oil of rose," which has in recent years been supplied and put on the market. This is an imitation of the genuine, and contains crystalline matter, and in some cases either has a percentage of genuine otto added to it or is distilled with roses. In odor it is far inferior, as at present made, to the genuine otto, and is easily distinguished from the latter when the odor is compared on blotting paper by any one accustomed to the fragrance of the natural product.—Pharm. Journ., Dec. 14, 1901, 664–665.

Otto of Rose—Pure and Artificial.—Referring to the preceding paper, in which Mr. Holmes had referred to Mr. John C. Umney in connection with his remarks on artificial oil of rose, the latter writes that he is glad to have an opportunity of explaining that the sample referred to, although having very similar physical characters to pure otto of rose, yet is in odor value, as compared with otto of rose, out of ratio even to the actual money value. Experiments made with the artificial otto of rose, both in tooth powders, toilet powders, and also soaps, have shown that its strength is

Otto of Rose—Constants of Reputable Samples.—Referring to the sweeping intimation conveyed by Dr. Holmes' paper (which see above, that otto of rose cannot, for practical purposes, be got pure, and that the Bulgarian manufacturers of the oil are alone responsible for it, E. J. Parry brings a mass of testimony from different sources which seems to point out that the adulteration of otto of rose is practiced nearer at home than in far Bulgaria. He also takes exception to the statement of Dr. Holmes that the otto of white roses is devoid of rose odor, and that it is used for the purpose of increasing the stearoptene content of the oil from red roses. He has had opportunity of examining and determining the constants of twenty specimens of otto of rose, which he has reason to believe to be pure and unadulterated, and gives the source of these in connection with the results obtained. These results are exhibited in the following table :

Sample.	S.G. at 30° C.	Opt. Rot. (100 Mm.).	Cong. point.	Sap. Val. (Per cent. KOH).	Stearoptene (Per Cent.).	S.G. of Oil <i>sine</i> Stearop.	M.-p. of Stearoptene.
1	0.8565	—2° 30'	20°	0.75	19	0.884	33.5°
2	0.8565	—3° 17'	20.5°	0.80	18	—	—
3	0.8555	—2° 25'	21°	0.69	18.5	—	—
4	0.8540	—2° 30'	21.5°	0.74	19	0.882	33°
5	0.854	—2° 32'	21°	0.91	20	—	—
6	0.8545	—2° 25'	21.5°	0.90	18.5	0.881	34°
7	0.8530	—2° 50'	22°	0.84	19.5	0.886	33°
8	0.8515	—2° 50'	22°	0.81	20	—	33.5°
9	0.8495	—2° 50'	23°	0.84	22	0.8855	34°
10	0.8490	—2° 25'	23°	0.96	22.5	—	—
11	0.8505	—2° 40'	22°	0.90	20	0.884	33.5°
12	0.8490	—2° 38'	22°	0.86	20.5	—	34.5°
13	0.8540	—2° 46'	22.5°	0.81	—	0.887	33.5°
14	0.8509	—2° 37'	22°	0.76	—	—	—
15	0.8505	—2° 46'	22°	0.78	—	—	—
16	0.8518	—3° 10'	21.5°	0.90	—	0.8835	34°
17	0.8515	—2° 50'	21°	0.86	19.5	0.880	35°
18	0.854	—3°	20°	0.74	18	—	—
19	0.852	—2° 45'	20°	0.90	18.5	0.884	34°
20	0.849	—2° 40'	21.5°	0.81	21	—	—

The whole question of adulteration of otto of rose must necessarily resolve itself largely into one of price, and an examination of nearly any supplier's price-list will show that the English dealer is fully alive to this point, as in this case, as with many other essential oil, one can usually find listed such qualities as "finest virgin," "good super," and "commercial." Large consumers who use otto of rose, and understand its value, can get genuine otto which has not been tampered with, a fact which is exemplified by specimens Nos. 1, 2, 3 and 4, representing four seasons' supplies to a Lon-

don firm of soapmakers, are practically identical both in odor and chemical character.—Chem. and Drugg., Mar. 8, 1902, 390,

Oil of Rose—Phenyl-ethyl Alcohol Content of the Water-soluble Portion.—H. v. Soden and W. Rojahn have made experiments to ascertain the content of phenyl-ethyl alcohol in rose blossoms. In order to obtain the whole of the oil, they extracted with ether the water passing over with direct steam in the distillation of 50 kilos of rose blossoms, and obtained in this manner 37.5 Gm. of oil of the sp. gr. 0.944 at 30° C. When the crude oil was distilled with water vapor, it yielded about 10 per cent. of rose oil of the sp. gr. 0.845 at 30°, the properties of which correspond in general with ordinary rose oil containing only a small quantity of phenyl-ethyl alcohol. The bulk (67.5 per cent. of the crude oil), passed over in the water during the distillation, whilst 13.5 per cent. was represented by residue and loss. The oil held in solution by the distillation water consisted chiefly of phenyl-ethyl alcohol. These results show that the crude oil obtainable from rose blossoms by distillation with direct steam and subsequent extraction of the water of the distillation with ether, consists to the extent of 50 to 60 per cent. of phenyl-ethyl alcohol, and that, consequently, in the production of Bulgarian rose oil from 2000 to 4000 kilos of this alcohol are absolutely wasted annually.—Schimmel's Rep., April, 1902, 57; from Berl. Berichte, 34 (1901), 2803.

Oil of Rose—Methyl-Anthranilic Acid a Probable Constituent.—The chemists of Schimmel & Co. found that, by extracting oil of rose with 20 per cent. sulphuric acid, a small quantity of a basic oil can be obtained which in solution has a blue fluorescence, and possesses a strong odor reminding of methyl anthranilate. On saponification with alcoholic potash and treatment with acetic acid, this basic oil yielded an acid, which in solution had a blue fluorescence, and which was extracted with ether. This acid behaves like an amido acid; it dissolves readily in dilute hydrochloric acid and soda, and it can be recrystallized from hot water. The crystals obtained from water had a melting point between 165° and 175°, and after subliming in vacuo the melting point could be brought to 173° C. The acid is consequently not anthranilic acid, but probably is identical with methyl anthranilic acid, whose melting point lies between 178° and 179°, while the basic oil is apparently the methyl ester of methyl-anthranilic acid.—Schimmel's Rep., Oct., 1901, 46.

Algerian Oil of Rue—Characters and Constituents.—H. von Soden and K. Henle report the results of an examination of Algerian oil of rue. It was of a pale yellow color, and had the odor of rue, with a distinct flavor reminding of certain ketones of the aliphatic series, such as methyl hexyl ketone. The sp. gr. at 15° C. was 0.842; optical rotation -3° ; saponification number 64. The oil did not solidify at -15° C. The principal constituent was found to be methylheptyl ketone, for which the following constants are given: Sp. gr. at 20°, 0.821; boiling point, 193° to

oil, which meet the ordinary requirements, and even the content of alcohol was in some cases more than 90 per cent. The examination of numerous samples of personally distilled East Indian sandalwood oils showed that in them the santalol content generally fluctuates between 93.5 and 97.7 per cent., but in no case is less than 92.5 per cent. Genuine, unadulterated East Indian sandalwood oil should, in Mr. Potoliet's opinion, satisfy the following requirements: Specific gravity at 15° C., 0.975 to 0.985; optical rotation, -17° to -20° ; soluble in 4 to 4.5 volumes of 70 per cent. alcohol at 20° C.; santalol content, at least 92.5 per cent.—Schimmel's Rep., Oct., 1901, 48.

East Indian Sandal Wood Oil—Solubility in Dilute Alcohol, Ph. Germ.—Messrs. Schimmel & Co. call attention to the fact that, as noted by them in the case of oil of lavender (which see), the permissible variation of 1 per cent. in the strength of the dilute alcohol of the Pharm. Germ. (68 to 69 per cent.) may render the official test of the solubility of East Indian oil of sandal wood negative. This test requires that "sandal oil" should make a clear solution with 5 parts of dilute alcohol. It is suggested that, inasmuch as this test will hold good only when dilute alcohol of 69 per cent. is used, and alcohol of 68 per cent. will only make a cloudy mixture, the Pharm. Germ. should specify dilute alcohol of a definite strength, for example 70 per cent. by volume. It is true that when the cloudy mixture of oil and 68 per cent. alcohol is heated to 24° C., it will clear up, and that it has therefore been suggested to direct a temperature of between 20° and 30° for the test. But this does not appear so desirable as the specification of an alcohol of definite strength for this purpose.—Schimmel's Rep., October, 1901, 49.

Sandarac Oil—Constituents.—Several years ago (1896) Tschirch and Balzer obtained from sandarac resin a small quantity of volatile oil by distillation of the powder with superheated steam—too small to allow of an examination. Th. A. Henry has now prepared some of the oil by adding a slight excess of alcoholic potash solution to an alcoholic solution of the resin, distilling off the alcohol, dissolving the residue in water, and extracting the solution with ether. The oil obtained after removal of the ether was immediately fractionated, and was found to consist mainly of hydrocarbons. In the low boiling portions d-pinene was detected, identified by the nitroso chloride and the nitrol piperidine. In the higher boiling fractions a body was found, which, after previous treatment with sodium, passes over between 260° and 280° C., and which appears to belong to the class of diterpenes. It does not combine either with hydrochloric acid or nitrosyl chloride or nitrogen trioxide. The yield of volatile is not given, but it is presumably small; nor does the author give any of the physical constants of the oil.—Schimmel's Report, October, 1901, 49; from Journ. Chem. Soc., 1901, 1149.

Oil of Turpentine—Compounds with Phosphorus, Iodine and Bromine.

—Hulot and Ramond state that when 5 Gm. of *phosphorus* is added in small pieces to 300 Gm. of oil of turpentine, and the two substances are allowed to react upon each other at the ordinary temperature for 6 days—or at 45° C. for 24 hours—a transparent, amber colored, agreeably odorous resin is formed, which is insoluble in water, but readily soluble in alcohol, ether, benzin, etc. It contains 6.5–6.75 per cent. of phosphorus, has an acid reaction, and forms soluble salts with alkalies, insoluble salts with the earthy bases. Notwithstanding its high percentage of phosphorus, this resinous compound is not poisonous, and has in other respects a therapeutic activity analagous to phosphorated oil and other preparations of phosphorus.

If *iodine* is carefully added in small fractional portions to an equal quantity of oil of turpentine under continuous shaking, a greenish-brown resinous product is obtained, which has an agreeable aromatic odor and a faint acid reaction, but is not caustic. It is insoluble in water, but dissolved by alcohol, ether, benzin, chloroform and fixed oils. This resinous compound, like that of phosphorus, is non-toxic, and has been used in daily doses representing 1 Gm. of iodine without inconvenience to persons who have been very sensitive to the effects of potassium iodide in very small doses. Its therapeutic action is similar to that of potassium iodide.

The corresponding *bromine* compound may be obtained by the very careful addition of the haloid to the oil, the reaction being quite violent. It is an amber-colored, non-caustic resin, having an acid reaction, and apparently non-toxic.—Pharm. Ztg., Jan. 4, 1902, 15: from Therap. Monatsh., 1901, No. 12.

Oil of Turpentine—Adulteration with Specially Prepared American Petroleum.—A. and P. Androuard call attention to the prevalent use of a specially prepared American petroleum in the adulteration of oil of turpentine; six out of nine samples recently examined being found to be thus sophisticated. The hydrocarbon oil is specially exported from the United States for the purpose under the name "white spirit." It is a colorless liquid with a bluish-violet fluorescence, its sp. gr. at 15° C. is 0.807, compared with 0.871 for pure oil of turpentine; consequently admixture of this adulterant is shown by a lowered specific gravity. Its rotation is also very low, —1.2 for 200 Mm., so that the rotation of the adulterated specimens is correspondingly lowered. The residue left on distillation is also very high, 42 per cent. at 205° C.; pure oil of turpentine gives 6 per cent. of non-volatile matter at this temperature. It is therefore easy of detection. Adulterated samples were found to have sp. gr. from 0.860 to 0.867; in rotation from —52.2° to —52.2°; residues on distillation at 205° C. of from 16 to 27 per cent. —Journ., Mar. 8, 1902, 193; from Journ. Pharm. C.

Oil of Turpentine.—Care necessary in applying the test depending on its solubility in *acetic acid*, which see under "Organic Acids."

Pine-Needle Oil—Production in Oregon.—E. Brown briefly describes the development of the "Thuringian" pine-needle industry as practiced in Oregon. The article is illustrated (in *Scientific American*, 84, 344) with two cuts, one showing the collection of the long needles of the yellow pine, the other the distillation of the oil.—*Pharm. Rev.*, Aug., 1901, 363.

Oil of Thyme—Product from the Dried Herb.—It is stated in Heinrich Haensel's Report (April, 1902) that the crude oil, obtained from dried thyme to the amount of 0.93 per cent. was of a dark brown color. On rectification the percentage is reduced to 0.8 per cent. and the color is yellow—while there is little change in the sp. gr., that of crude oil being 0.925, of the rectified oil 0.921 at 13° C.—*Pharm. Ztg.*, April 19, 1902, 306.

Oil of Thyme—Variation in True Oil Due to Method of Distillation.—Having found that unsophisticated specimens of thyme oil may vary in phenolic value from 5 to 60 per cent., P. Jeancard and C. Satie attribute this variation to improper distillation and inefficient bulking of the distillates. They find that on steam distillation the last fractions are practically all phenols, while the first fraction may consist almost wholly of non-phenol bodies. The same applies to ajowan oil and to lavender oil, the thymol in the former, and the esters in the latter, being found in great preponderance in the last portion of the distillate. The authors emphasize the importance of attention to these points by commercial distillers.—*Pharm. Journ.*, Nov. 9, 1901, 523; from *Bull. Soc. Chim.* [3], 25, 893.

French Oil of Thyme—Phenol-Content.—Contrary to the usual observation that French oil of thyme as a rule has a phenol-content of 20 to 25 per cent., which but rarely increases up to 42 per cent., Jeancard and Satie report that, according to their experience, the phenol-content varies between 5 and 60 per cent., and that the figures mentioned can only be taken as average values. They have proved by experiments that the phenol-content is most intimately connected with the method of distillation. In steam distillation the phenols only pass over more abundantly towards the end of the process, consequently a smaller or larger phenol-content of the oil obtained from the same material will depend entirely upon the manner in which the distillation has been conducted. Both specific gravity and solubility in dilute (70 per cent. by volume) alcohol increase with the phenol-content.—*Bull. Soc. Chim.*, iii, 25 (1901), 893.

Schimmel & Co., referring to the above, observe that the authors have partly had to do with oils which were not normal distillates, but rather individual fractions of one distillation. According to the experience of Schimmel & Co., French thyme oils have always the phenol-content of about 20 per cent.—Schimmel's Report, April, 1902, 65.

into bibromide, the bi-bromo-cymol is dissolved in fuming sulphuric acid, and the solution diluted with water. The liquid separates into two layers, the lower layer containing bi-bromo-cymolsulphonic acid, which crystallizes from the separated layer on cooling. The bromo-cymol sulphonic acid is then decomposed by means of zinc dust and concentrated ammonia, the mixture being heated in a closed vessel to 170°C . The bromine is in this way almost completely split off; the excess of ammonia is removed by evaporation, and the residual liquid filtered to remove zinc oxide. Any undecomposed bromo-cymolsulphonic acid crystallizes out as zinc salt on concentrating the solution, which is then again filtered, evaporated to dryness, pulverized and melted at 300°C ., with potassium hydroxide until the melt separates into two layers—the upper layer consisting of potassium thymolate, the lower of uncombined potassium hydroxide. The upper layer being removed, it is dissolved in water, diluted sulphuric is added in excess, and the separated thymol finally purified by distillation. Finally, the oily product is cooled, when, on addition of a crystal of thymol it congeals to a crystalline mass.—Pharm. Centralh., Oct. 17, 1901, 650.

Aristol—Impurities.—H. Cousin finds that commercial aristol, besides containing less than the theoretical amount of iodine, is frequently contaminated with a notable amount of inorganic matter, and contains, as well, much chlorine in organic combination. This last impurity is evidently derived from the employment of alkaline hypochlorites in the process of manufacture. Of six samples examined, the worst contained but 41.65 per cent. of dithymol diiodide, the best 87 per cent. One specimen contained 7.4 per cent. of inorganic salts, insoluble in ether, the best showed the presence of 1.4 per cent. of this impurity. All were found to contain more or less chlorine, the best 0.29 per cent., and the worst 10.38 per cent. The iodine present ranged from 19.6 to 42.58 per cent.; the theoretical amount for pure dithymol diiodide being 46.18 per cent. The chloro-compound of thymol obtained by pouring an alkaline solution of that phenol into a solution of sodium hypochlorite, which closely resembles aristol in appearance, is being examined.—Pharm. Journ.; from Journ. Pharm. Chim. [5], 15, 279.

Oil of Wormwood—Adulteration with Oil of Turpentine.—Lyman F. Kebler has found quite a considerable quantity of oil of wormwood to be adulterated, usually with oil of turpentine. The result of an examination of eight samples is tabulated as follows:

Number.	Sp. Gr. at 15° C.	Solution in 2 vols. 80 per cent. alcohol.	Solution of 1st 10 per cent. of distillate in 2 vols. of 80 per cent. alcohol.
1.....	0.9128	Insoluble.	Insoluble.
2.....	0.9104	Insoluble.	Insoluble.
3.....	0.9362	Soluble.	Soluble.
4.....	0.9071	Insoluble.	Insoluble.
5.....	0.9262	Soluble.	Soluble in 2-3 vols.
6.....	0.9299	Soluble.	
7.....	0.9364	Soluble.	Soluble.
8.....	0.9112	Insoluble.	Insoluble.

These results show Nos. 1, 2, 4 and 8 to be deficient in a number of points, and careful investigation showed that they were liberally adulterated with oil of turpentine, the odor of which, indeed, was perceptible in several samples.—Amer. Jour. Pharm., March, 1902, 142.

Ylang-Ylang and Patchouli Oils—Botanical Source.—Some interesting details of the plants which yield the oils of patchouli and ylang-ylang are given in a recent issue of the Annual Report of Roure-Bertrand Fils. The source of the Penang

Oil of Patchouli is well-known to be *Pogostenum Patchouli*, but that of the Java oil has hitherto been a matter of doubt. It now appears that the two plants are merely varieties of *P. Patchouli*, the Javanese tree having more elongated leaves. The leaves of both plants are shown above. Numerous foreign leaves have been found in the bales of patchouli-leaves which appear on the European market, and, according to Bertrand, the principal of these are the two leaves here depicted, viz.: *Urena lobata* and *Hyptis suaveolens*. The former is practically inodorous, and is known by the Malays as “down poo poolate.” The latter has an odor of pennyroyal, and is called “Selasih hutan.” It is usually assumed that

Oil of Ylang-Ylang and the “cananga oils,” are derived from the same plant, and that the difference in the method of production accounts for the great difference in the odor-values of the oils. Bertrand supports this statement, but at the same time points out that a Javan distiller affirms that his oil of cananga is distilled from an entirely different plant from *Cananga odorata*. Bertrand considers the differences in climate and in the methods of distillation are quite sufficient to account for the difference noted in the oils.—Chem. and Drugg., June 7, 1902, 908.

Ylang-Ylang Oil—Constituents.—On saponifying ylang ylang oil, which had previously been washed with distilled water, with aqueous solution of potash, heating the mixture for ten hours to 100° C., and distilling the aqueous liquor obtained, Georges Darzens obtained methyl alcohol, which was subsequently converted, for further identification, into the character-

aqueous liquor is then separated by the introduction of carbonic acid, and shaken with benzoyl chloride and soda solution. This produced the benzoyl compound of p-cresol, melting at 70° to 71° C. Acetic and benzoic acid were also detected in the saponification liquor. The author is of the opinion that p-cresol is present in ylang-ylang oil in the form of acetyl-p-cresol, which compound is said to possess an ylang-ylang odor.—Bull. Soc. Chim., iii, 27 (1902), 83.

Referring to the preceding, Schimmel & Co. mention that they have also been able to detect methyl alcohol in ylang-ylang oil, and that this is not present in the free state, but in the form of an ester, for it was produced in saponifying with aqueous potash liquor, and identified by suitable methods described. Benzoic acid having also been found in the saponification liquor, the experiments indicate that the methyl alcohol is present as methyl ester of benzoic acid, and this is confirmed by the odor. The benzoic acid, however, is also present in this oil, combined with benzyl alcohol, as has been determined by a number of experiments mentioned.—Schimmel's Rep., April, 1902, 67.

ALCOHOLS AND DERIVATIVES.

Alcohols—Derivatives from the Volatile Oils of Plants.—Florence Gage and I. W. Brandel, in continuation of their "classification and occurrence of the constituents of volatile oils," enumerate the plants which so far have been mentioned as yielding ethyl- and methyl-alcohol. The occurrence of the latter as such in plant organisms has not been established beyond doubt, but it has been isolated beyond question from the distillates of a number of plants. It is described as occurring in quantities ("massenhaft") in the distillate from oil of cloves, exists in orris oil, and, as methyl salicylate, is very widely distributed in nature. It is noteworthy, also, that "ethyl-alcohol" is frequently an accompanying product obtainable from the same plants. Omitting the details and citation of authorities, the following plants are known to yield *methyl-alcohol*: *Heracleum giganteum* and *H. sphondilium*; *Thea chinensis*, L.; *Eugenia caryophyllata*, Thunb.; *Erythroxylon coca*, Lam., var. *spruceanum*, Brck.; *Indigofera galegoides*, D. C.; *Indigofera* ? from Guatemala; *Caesalpinia sappan*, L., and *Ageratum conyzoides*.

Ethyl alcohol has been found in the following plants, in form of esters, presumably combined with butyric, caproic, oxymyristic, veratric and cinnamic acids: *Rosa centifolia*; *Heracleum giganteum*, and *H. sphondilium*; *Peucedanum sativum* (*Pastinacea sativa*, L.); *Anthusus cerefolium*, Hoffm.; *Eucalyptus* sp. ?; *Indigofera galegoides*, D. C.; *Sabal serrulata*; *Sabadilla officinalis*, and *Liquidambar orientalis*.

Amyl Alcohol.—Of the eight isomeric amyl alcohols known, five have been obtained exclusively by strictly artificial means only, *i. e.*, without the

and active amyl alcohol, respectively, have been produced by ferment action, and of these only the second one,

Iso-amyl alcohol, has been found ready formed as esters in plants, viz: in a Eucalyptus oil—probably from *Eucalyptus globulus*, and in Roman chamomile oil.

Hexyl alcohol has been obtained from the oil of *Heracleum giganteum*, from the saponified oil of *Aspidium filix mas* and in Roman chamomile oil. The latter has also been found to contain

Isobutyl alcohol, but

Propyl alcohols have so far not been found in any volatile oil or in the aqueous distillates of plants, though primary propyl alcohol has been isolated from the fusel oil from rack wine and from grain spirit.—Pharm. Rev., July, Aug. and Dec., 1901, 306-310, 355-360, and 534-540.

Alcohols—Detection in their Corresponding Ethers and Esters.—R. Grassini recommends the following simple test for detecting the presence of the different alcohols—ethyl, methyl, amyl and isobutyl alcohol—in their ethers and esters: A mixture of 2 to 3 Cc. each of 5 per cent. cobaltous chloride and of potassium sulphocyanide is prepared and a layer of the ether or ester to be tested is poured on a *partial* admixture being effected by gentle shaking. In the presence of one of the alcohols named a more or less intense blue color will develop at the point of contact of the two layers extending partially through the upper layer. The reaction appears to be dependent on the reduction of the cobalt salt. Nickel salts do not interfere with this reaction.—Pharm. Centralh., Dec. 19, 1901, 805.

Alcohol—Necessity of a Test for the Presence of Wood Alcohol.—Lyman F. Kebler calls attention to the necessity of a pharmacopœial test for wood alcohol in grain alcohol. In his experience none of the proposed tests are efficient. The differential aldehyde tests serve some purpose, but the results are not sufficiently characteristic to justify the analyst in making an absolute decision. Careful fractionation with a long distillation bulb has given the author more satisfactory results than any other procedure. In this way he has been able to detect the presence of from 5 to 10 per cent. of methyl alcohol. Such mixtures always begin to distill considerably below the boiling point of ethyl alcohol. There may be other bodies present, like acetone or methyl acetate, which lower the normal boiling point of ethyl alcohol, but they must all be considered impurities on a par with wood alcohol. By employing fractionation, the portion coming over below 78° C., can be tested for wood alcohol, etc., with the usual methods, and the results are generally much more satisfactory than if these tests are applied to the grain alcohol direct.—Amer. Drugg., Mar. 24, 1902, 161.

Deodorized Alcohol—Extension of its Use for Making Pharmacopœial Preparations.—Prof. P. E. Hommell, calling attention to a recent sugges-

cause it is a "useless luxury," gives examples of its utility, and states that, to the contrary, its use should be extended so as to include all tinctures, spirits and elixirs of the U. S. P. and N. F. in which at present ordinary alcohol is directed.—Proc. N. J. Pharm. Assoc., 1901, 58-60.

Magnesium Ethylate—Preparation and Properties.—L. Meunier has obtained magnesium ethylate by the action of absolute alcohol, in the cold, on magnesium amalgam. When washed with anhydrous ether and quickly dried on a porous plate, it forms a white amorphous powder, which possesses properties analogous to those of the alkaline ethylates. With ethylic aldehyde magnesium amalgam reacts with great violence, but if the action be moderated by diluting the aldehyde with anhydrous benzene or anhydrous ether a syrupy liquid is obtained, which, when boiled with aqueous alcohol, precipitates gelatinous magnesium hydrate; on filtering this off and distilling the filtrate a fraction boiling at 185° C. is obtained, which is β - γ -dioxybutane— $\text{CH}_3\text{—CHOH—CHOH—CH}_3$.—Pharm. Journ., Mar. 15, 1902, 213; from Compt. rend., 134, 473.

Ether—Distillation by Electric Heat.—E. Thielo has devised an apparatus for distilling ether by the aid of an ordinary electric incandescent lamp, as shown by Fig. 51. It consists of an earthenware vessel into the bottom of which an electric bulb is fastened, and which a short distance above this bulb is provided with a ring for the reception of a triangle upon which the distilling flask rests—the support of the whole being an ordinary tripod. The heat generated by the incandescent bulb will of course vary according to the tension of the current. For the distillation of ether a tension of 110 volts and $\frac{1}{2}$ – $\frac{3}{4}$ amperes is sufficient.—Pharm. Ztg. Sept. 12, 1901, 739; from Chem. Ztg., 1901, No. 65.

FIG. 51.

Acetic Ether—Difficulty to Obtain it of U. S. P. Strength.—Lyman F. Kebler states that acetic ether is seldom 98.5 per cent. pure. It seems to be commercially impossible to make it; most of the articles met with contain from 65 to 90 per cent of pure acetic ether, the remainder consisting of alcohol.—Amer. Drugg., Mar. 24, 1902, 161.

Ethyl Bromide—Tests of Purity and Commercial Quality.—J. F. Gilmour, after reviewing the history, modes of preparation, distinctive char-

acters, and physiological prerequisites of ethyl bromide, gives the results of an examination of fifty samples of this anæsthetic on the basis of the following tests :

(1) If equal volumes of ethyl bromide and distilled water are agitated together, there should be no volume alteration (alcohol), and the separated watery layer should not redden blue litmus paper, nor give any precipitate with silver nitrate (absence of hydrobromic acid and bromide).

(2) Agitated with its own volume of pure concentrated sulphuric acid, no yellow or other coloration ought to appear, even after the lapse of an hour (absence of organic compounds of sulphur and ethylene and amyl compounds).

(3) If drops of the sample are allowed to fall gently into a layer of potassium iodide solution (1 : 5), the drops, on reaching the bottom of the vessel, should not have acquired a violet color (absence of free bromine).

Of the fifty specimens to which all the foregoing tests were applied, 30 = 60 per cent. were utterly unfit for anæsthetic purposes, owing to the presence of deleterious compounds. Of the set of 50, 25 = 50 per cent. contained free hydrobromic acid, and 2 = 4 per cent. free bromine. 20 = 40 per cent. had a distinct garlicky odor (phosphoretted hydrogen), 40 = 80 per cent., when subjected to the sulphuric acid test, developed the characteristic coloration due to sulphur, ethylene, and amyl compounds, and 10 = 20 per cent. showed the yellow color said to indicate the presence of organic compounds of sulphur. The only perfectly pure specimen in this series was of French origin, and came stored in small actinic glass, hermetically sealed flasks. Although theoretically the samples containing sulphur and other impurities should have been rejected, yet, as it was impossible to get any commercial product free from them, only the exceptionally bad samples were condemned.—Pharm. Journ., June 7, 1902, 490–491.

Chloroform — Estimation in Chloroform-Ether.— In the course of numerous alkaloidal estimations the chloroform-ether mixture employed in the shaking out process accumulates in such quantities as to make its purification for subsequent use, by redistillation and dehydration, etc., desirable. W. A. Puckner, however, has in practice often been in doubt whether the chloroform-ether mixture so purified contains the two solvents in the original proportions, and has therefore turned his attention towards devising a convenient method for estimating the amount of chloroform in the mixture. Of the many methods proposed that of L. de Saint Martin depending on the decomposition of the chloroform by treating with alcoholic potassium hydroxide, and the subsequent titration of the potassium chloride formed ; but a practical objection to the process is the requirement of sealed tubes to effect the decomposition of the chloroform. He now gives in some detail the experiments made, which lead him to suggest the following method which permits the use of ordinary flasks or vials : To

10 Cc. of an approximately normal alcoholic solution of potassium hydroxide, either free from chlorides or else of a known chlorine content, and contained in a vial, add a measured volume of the chloroform-ether mixture representing approximately 0.05 to 0.2 Gm. of chloroform, stopper the vial with a sound cork, cover with a cloth and tie this firmly over the stopper. Mix the two liquids by rotation, *carefully avoiding to let them touch the cork*; then place the vial in boiling water and retain the temperature three hours. Remove the vial from the bath, let cool, add phenolphthalein and then sufficient sulphuric acid to exactly neutralize; then add two drops of potassium chromate T. S. and titrate with decinormal silver nitrate, 1 Cc. of which represents 0.003969 Gm. chloroform. Rubber stoppers are not available for this reaction, while cork answers perfectly provided care is taken that the liquid does not come in contact with it during any stage of the process.—Pharm. Arch., July, 1901, 124–128.

Chloral Hydrate—Solvent Properties of its Solutions.—Richard Mauch has made a comprehensive series of investigations concerning the solvent action of aqueous solutions of chloral hydrate (and, for comparison, also of alcoholic solutions) upon organic and inorganic substances, with the object of determining in a systematic way the possible utility of this solvent power in pharmaceuto-chemical analysis, as well as to ascertain the nature of its action in modifying the reaction of iodine with the various starches, and the extent of its power, in the dry state, to liquify certain solids. The results obtained are summarized by the author as follows:

The concentrated 60–80 per cent. aqueous solution of chloral hydrate exerts a remarkable solvent effect upon a large number of organic substances, which is incomparable in every direction with the solvent action of any other liquid.

Alkaloids and their salts, in particular, are dissolved in large quantities and with ease; while *glucosides*, *bitter principles* and similar substances, as well as most of the *resins* are perfectly soluble in it.

Gum-resins are completely soluble only in a 60 per cent. solution of chloral hydrate, while the concentrated solution readily dissolves those *volatile oils* which are largely composed of oxygenated constituents, the *camphors* and *phenols*, most of the organic coloring matters, the *tannins*, *sugars*, *dextrins* and *gums*, the gelatins and keratin.

Gum (Arabic? Rep.), *starch*, and *albuminoids* are slowly dissolved after previous soaking and swelling.

The *fixed oils* and *solid fats* are sparingly soluble, while the *waxes* and *hydrocarbons*, including *caoutchouc* and *gutta percha* are difficultly soluble or nearly insoluble. The solvent action on the fixed oils is greater in the cold than warm, and concentrated alcoholic solutions dissolve them easily.

Cellulose, nitrocellulose and silk-fibre, as also *iodide of starch* and *indigotin* are insoluble.

Towards *inorganic bodies* the concentrated aqueous solution of chloral hydrate possesses no pronounced solvent action. The 80 per cent. solution dissolves 1 part of iodine in 560 parts.

The liquefying power of chloral hydrate (in substance) upon other organic bodies is far more extended than has heretofore been observed, and is by no means confined to camphor or phenolic bodies. Furthermore, those bodies that are liquefied by dry chloral hydrate, either at the ordinary temperature or at about 30°–45° C., are as a rule also abundantly soluble in 80 per cent. chloral hydrate solution.

The swelling and solution of *starch grains* by chloral hydrate can be effected only with 40–70 per cent. solution, and is best with 50–60 per cent. solutions. With 80 per cent. solution the temperature of a steam-bath is necessary. In the solutions produced, the starch is present in form of amylo-dextrin and amylogen, dextrin being present in traces only, while dextrose is entirely absent. The effect of swelling in chloral hydrate solutions is not the same on all kinds of starch.

The iodine reaction is retarded in chloral-starch solutions in proportion to its concentration, and if it contains more than 70 per cent. of chloral hydrate it may even be completely prevented.

The practical applications of these observations to chemical and microscopical investigations are numerous. Apart from the utility of the 60–80 per cent. chloral-hydrate solutions in clearing up microscopic preparations, they are advantageously used in the following cases :

1. In the examination of alkaloidal or glucosidal residues obtained in the course of toxicological chemical analysis.
2. In the guaiac-resin reaction of blood.
3. For distinguishing between different sorts of dammar resin.
4. For the recognition of a resin, gum-resin, etc., present in very small quantity.
5. For distinguishing between galbanam, ammoniac, asafetida and sagapenum.
6. For the quantitative determination of gum in gum resins.
7. For the isolation of the volatile oils of copaiba and gurjun balsam.
8. For the examination of copaiba for adulterations with gurjun balsam or turpentine.
9. The examination of balsam of Peru for castor oil, copaiba and gurjun balsam.
10. For the detection of the last two in volatile oils in general.
11. For the extraction of coloring matters.
12. For the preparation of pure amylo-dextrin and amylogen.—Arch. d. Pharm., 240, Nos. 2 and 3 (Feb. 27 and April 15, 1902) 113–134 and 166–178.

either heavy or light oil of wine of uniform quality, no two products of either being obtainable alike. The various books describe them as consisting of such and such constituents, but no two of them agree on the same. The lighter oil was usually found to have a lower boiling point and lower specific gravity than the heavy oil, but further than that it was impossible for the author to establish a difference. He expresses the opinion that both are obtained by distilling the residue left in the manufacture of ether, the lighter oil being the first portion of distillate, while the heavy oil is an intermediate or higher boiling point product. The present Pharmacopœia fails to prescribe any requirement of value for ethereal oil, excepting specific gravity. It is desirable that a standard should be fixed.—*Amer. Journ. Pharm.*, Jan., 1902, 18.

Normal Butylic Alcohol—Successful Synthesis.—Marcel Guerbert has found that, although ethylic alcohol does not give rise to butylic alcohol when sodium ethylate is heated with absolute alcohol to 210° C., in the same manner as iso-amyl alcohol forms di-amyl alcohol, if barium ethylate be substituted for sodium ethylate, the synthesis of butylic alcohol could be brought about, although the yield was not large. By prolonged heating of saturated solutions of barium ethylate in absolute alcohol in sealed tubes to $230-240^{\circ}$ C., a small quantity of butylic alcohol, boiling at $115-117^{\circ}$, was obtained on fractional distillation, which yielded butyric acid on oxidation.—*Pharm. Journ.*, Aug. 31, 1902, 293; from *Comptes rend.*, 133, 300.

Methyl Alcohol—Colorimetric Method of Detection in Alcoholic Tinctures.—J. Habermann and K. Oesterreicher propose a colorimetric method for the detection of methyl alcohol in tinctures, which is based on the observation made many years ago by Cazeneuve and Cotton that ethyl alcohol very slowly converts the red color of a dilute permanganate solution to yellow, whereas methyl alcohol causes this conversion very rapidly. The present authors have made the further observation that this change from red passes at considerable and distinct intervals through violet, blue-violet, green and yellowish-green to yellow—the complete change being effected in about 15 minutes; but if the liquid contains appreciable quantities of methyl alcohol (5 per cent. and over) along with large quantities of ethyl alcohol, the chromatic change is completed within one minute—in fact, so rapidly that the various colors are no longer distinctly visible, the red apparently passing directly through green and the various shades of yellow to permanent yellow. The test is carried out on the distillate obtained from the tincture, which must contain only water and ethyl alcohol besides the suspected methyl alcohol, by adding to 10 Cc. of the liquid 2 drops of ordinary solution of potassium hydroxide, mixing, and adding 1 or 2 drops of $\frac{N}{10}$ potassium permanganate solution. In the

presence of less than 5 per cent. of methyl alcohol the same color reactions as with pure ethyl alcohol are produced, but they are not so distinct. In this case a satisfactory chromatic reaction is obtained by redistilling the liquid and collecting only the first 50 per cent. passing over.—Pharm. Ztg., Dec. 28, 1901, 1033; from Ztschr. f. Anal. Chem., 1901, No. 11, 721.

Wood Alcohol—Advantages and Disadvantages as a Fuel.—A. B. Lyons calls attention to the fact that while methyl alcohol is undoubtedly a cheaper fuel than grain spirit, costing less and generating, weight for weight, more heat, its use is attended with inconveniences that must be taken into consideration. Its greater volatility not alone occasions greater waste, but its use is coupled with more dangerous inflammability than is that of grain alcohol. Moreover, during combustion it gives rise to corrosive vapors, which is evidenced, for instance, in the rapid corrosion of the brass wire-gauze covering the asbestos when wood alcohol is burned in the safety spirit lamps commonly in use at the tea-table.—Amer. Journ. Pharm., July, 1901, 360.

Wood Alcohol—Methods of Improving Odor.—In reply to the "query," To what extent are substances used to counteract or improve the odor of so-called purified wood alcohol? Frederick T. Gordon states that, as far as he has been able to learn, there is nothing that will successfully counteract the odor of wood alcohol per se. In preparations made from it, however, the addition of more odorous substances will mask the odor to some extent. The only way of "improving" the odor of wood alcohol is by purifying it. This is done by chemical treatment and fractional distillation, practiced only on a large scale by manufacturers, and such pure wood alcohol, or methyl alcohol, is readily obtainable on the market. The so-called "Columbian Spirit" is an exceptionally pure methyl alcohol, answering all the requirements as to sp. gr., boiling point, freedom from color, and odor; the latter being very slight and resembling that of grain alcohol.—Proc. Pa. Pharm. Assoc., 1901, 120.

Disodic Methyl Arsenate—A Valuable Remedy for African Malarial Fever.—Armand Gautier has obtained a series of extraordinarily successful results in the treatment of paludism with hypodermic injections of disodic methyl arsenate, $\text{AsCH}_3\text{O}_2\text{Na}_2$. Although the salt has relatively low toxic power, it has effected a complete cure in nine cases of African malarial fever, all of which had derived but little benefit from quinine. In two cases a single injection of 5 Cgm. of the salt was sufficient to remove the hæmatozoa from the blood, and to effect a complete cure; two others required two such injections, and the remainder four injections at intervals of one or two days. In one specially obstinate case the dose of the last two injections was increased to 7.5 Cgms. In no case had a relapse occurred at the time of reporting.—Pharm. Journ., Mar. 29, 1902, 253; from Compt. rend., 134, 329.

polymeric modifications, in a liquid form, by the following simple method: Anhydrous potash is dissolved in the ordinary 40 per cent. formaldehyde solution until it dissolves very slowly and the excess separates out after vigorous shaking in solid form. During this manipulation the solution at first assumes a light violet-blue color, which changes during the successive additions of potash to a greyish-yellow; but when fully saturated with potash it separates, on standing, into two colorless layers, the upper layer consisting of liquid formaldehyde, the lower of a saturated aqueous potash solution. Operating on 350 Cc. of 40 per cent. formaldehyde, 200 Gm. of potash were required for complete saturation, and, after standing half an hour, yielded 150 Cc. of crude liquid formaldehyde. This was shaken with a small quantity of potash and filtered through a dry filter. So obtained, liquid formaldehyde is a colorless mobile fluid, having the sp. gr. of 1.1902 at 16° C., and is miscible in all proportions with water, alcohol or ether. When dried by means of lime or calcium chloride, it may be distilled, the greater portion passing over at 91° C. The distillate may be preserved, in the liquid state, and apparently unchanged, in hermetically closed vials over lime.—Pharm. Ztg., Feb. 22, 1902, 150; from Chem. Ztg., 1902, No. 13.

Formaldehyde—Quantitative Determination with Silver Nitrate.—The recently proposed "permanganate method" for the quantitative estimation of formaldehyde by L. Vanino and E. Seiter, may, according to Vanino, with advantage be replaced, as well as all others, by a method which depends upon the decomposition of silver nitrate in the presence of formaldehyde and sodium hydroxide into metallic silver and silver oxide in equivalent proportions, subsequent solution of the oxide in diluted acetic acid, drying and weighing the residual metal. The process is conducted as follows: 2 Gm. of silver nitrate are dissolved in water, pure sodium hydroxide solution is added to strong alkaline reaction, and 5 Cc. of a formaldehyde dilution (10 Cc. of formalin and 100 Cc. of water) are added under constant stirring. The mixture is then set aside for 15 minutes, protected from the light, the clear supernatant liquid is decanted on a tared filter, the residual precipitate digested 3 to 4 times with 5 per cent. acetic acid, then transferred to the filter, and washed with water acidulated with acetic acid so long as the washings give a reaction for silver on addition of hydrochloric acid. It is then dried at 105° and the residual silver weighed—216 parts of silver corresponding to 30 parts of formaldehyde.—Pharm. Ztg., Dec. 28, 1901, 1033; from Ztschr. f. Anal. Chem., 1901, No. 11.

Formaldehyde—Detection in Food Products.—According to C. Arnold and C. Mentzel the detection of formaldehyde in food products may be easily and rapidly effected without distillation, as follows: Dissolve a

small quantity of phenylhydrazine hydrochloride (about the size a pea) in 3 to 5 Cc. of the suspected liquid (or solution prepared from solid food, meats, etc.) add 2 to 4 drops (not more) of a 5 to 10 per cent. sodium nitroprusside solution, and then, drop by drop, 8 to 12 drops of a solution of alkali hydroxide. An immediate blue to blue-grey color is developed, according to the quantity of formaldehyde present, which remains for a long time. With milk, containing as little as 0.015 Gm. per liter, a distinct green color is developed, while pure milk gives simply a yellowish color, and if it contains 0.05 Gm. of formaldehyde per liter, a handsome blue color results. A more sensitive reaction is obtained, however, if the nitroprusside is replaced by potassium ferricyanide. In this case, an intense scarlet-red color is developed, which remains unchanged for days. The last named reaction is not suitable for milk, and for meat solutions only if these are not reddened by blood coloring matter.—Pharm. Ztg., April 9, 1902, 277; from Chem. Ztg., 1902, No. 23.

Formaldehyde—Strength of Solutions Useful in Different Diseases.—Geo. Roe recommends the following strengths of solutions of formaldehyde—the percentages referring to 40 per cent. formalin—that have been found useful in the diseases named:

(Of 40 per cent. formalin.)	
Diphtheria, as a spray	$\frac{1}{2}$ to 1 per cent.
Diphtheria, as a paint	1 in 500.
Ophthalmic practice.....	1 in 2000.
Ringworm (small patches) (applied for a few minutes every second day).....	40 per cent.
Tissue hardening (according to thickness).....	1 to 10 per cent.
Sterilizing instruments	10 per cent.
Sterilizing hands	$\frac{1}{2}$ per cent.
Gargles	$\frac{1}{4}$ per cent.
Vaginal douches	1 in 500.
Pruritus vulvæ, spray with	4 per cent.

—Chem. & Drugg., Nov. 2, 1901, 726.

Sodium Cacodylate—Reactions with Metallic Salts.—Prot. Dioscoride Vitali, in the course of a comprehensive paper on cacodylic acid and its forensic determinations, gives the following characteristic reactions obtained on the addition of the metallic salts indicated to a 1 per cent. solution of sodium cacodylate:

Cupric Sulphate—an azure blue color, followed after a time at ordinary temperatures, immediately if warmed, by the production of a blue gelatinous precipitation.

Cobaltous Chloride—a rose-red color, changing to violet and blue, and becoming decidedly turbid.

Nickel Nitrate—a light green color, no precipitate in the cold, but forming a greenish gelatinous precipitate on heating.

Mercurous Nitrate—a yellowish precipitate, becoming black on heating moderately.

Mercuric Nitrate—a white precipitate, which becomes heated, but not brown.

Neutral Lead Acetate—a faint whitish turbidity.

Ferrous Sulphate—no precipitate in the cold, but a green precipitate on heating.

Ferric Sulphate—no color reaction in the cold, but a brown precipitate on heating, which remains permanent on cooling.

Silver Nitrate—a white, slimy precipitate.

Cacodylic acid possesses great stability. Its arsenic molecule is not destroyed by the action of the strongest oxidizing agents, such as potassium dichromate, in large quantities and after 3 to 4 hours reaction. Even the Marsh test is not possible to determine more than one-half the arsenic present in the acid. Marsh's apparatus.—Pharm. Ztg., Dec. 11, 1901, 986; from Pharm. Ztg., October, 1901.

Crude Carbolic Acid—Inadequacy of the U. S. P. Tests
Lyman F. Kebler regards the pharmacopœial tests for the quality of crude carbolic acid as quite unsatisfactory. On 100 volumes of the acid with 950 volumes of water, then agitating the mixture is generally left in such a condition as to make it impossible to get an accurate reading, the fine globules of acid adhering to the sides of the vessel as to make it impossible to remove them. He comes to the conclusion that fractional distillation and a separation of the several fractions is the best and probably the only way to get a good idea of the quality of crude carbolic acid. The range of boiling points should be carefully noted. Low grade acids containing all the way from 10 to 100 per cent. of carbolic acid or its homologues are a common article in commerce, and should not be confused with the official product. Pharm. Ztg., Dec. 9, 1902, 343.

Carbolic Acid—Cause and Prevention of Reddening.—Gordon, in reply to a "query," observes that the recent investigations of Walther indicate the cause of the reddening of carbolic acid to be the ozone or hydrogen peroxide of the air acting in the presence of iron derived from the glass of bottles or the "tin" of containers. This seems to be corroborated by Mr. Gordon's experiments. Carbolic acid free from iron gave a marked reaction for iron when being kept in green glass bottles for six months, and this acid, which was white, is now a deep red color. 5 Cc. (portions) of iron-free carbolic acid were placed in bottles, and the following tests were made: in a green glass bottle, coated inside with paraffin and tightly corked, remained white after two months' standing; another 5 Cc. in a similar bottle of bottle, uncoated and uncorked, became of a light red color.

time. 5 Cc. acid in an iron-free bottle, with two drops of iron sulphate solution, became red in three days; another sample with five drops of H_2O_2 , became red in a few hours. An iron-free acid in a paraffin-coated bottle with five drops of H_2O_2 , remained white, when a tiny bit of iron wire was dropped in, a red color appeared in about ten days. To prevent the reddening of carbolic acid, it must be free from iron and be kept in iron-free containers (bottles coated inside thickly with paraffin are very good) and kept tightly corked. Exposure to light seems to bleach reddened crystals. If red crystals are melted and the first crystallization separated, this will often give a white acid.—Proc. Pa. Pharm. Assoc., 1901, 127.

Iodo-Phenols—Conditions of Formation.—P. Brenans describes the conditions under which he has obtained two iodo-phenols. A mixture of the two is obtained in the form of a greyish crystalline precipitate when a solution of four molecules of iodine in potassium iodide is added to one of phenol dissolved with two molecules of potassium hydroxide. If, after washing and drying this precipitate *in vacuo*, it is treated by steam distillation or is submitted to fractional precipitates with water from alcoholic solution, this mixture is separated into its two constituents, di-iodo-phenol and tri-iodo-phenol.

Di-iodo-phenol, $\text{OH.C}_6\text{H}_3\text{I}_2$, is volatile in steam, but is best obtained by precipitation from alcoholic solution by means of ice water. It forms long colorless needles, melting at 72°C .

Tri-iodo-phenol, $\text{OH.C}_6\text{H}_2\text{I}_3$, is the compound already described by Lantemann. It is but slightly volatile in aqueous vapor, and melts at 156°C .—Pharm. Journ., Sept. 7, 1901, 313; from Bull. Soc. Chim. (3), 25, 629.

Asterol (Mercuric Parasulphophenylate)—Preparation of Stable Solutions.—Asterol having during the past two years been recommended as an efficient substitute for corrosive sublimate and other soluble mercuric salts for preparing surgical disinfectant solutions, because of its freedom from corrosive action upon the hands and the instruments, and because it does not form difficultly soluble compounds with albumen, Dr. Paul Schwarz has further investigated its characters with the purpose of determining the best method of preparing its solutions, and of rendering the new compound more generally available. He finds that it is easy to prepare 0.4 per cent. solutions by simple solution in hot water, such solution possessing the same disinfectant action as a 0.1 per cent. solution of corrosive sublimate, while by boiling the asterol with water and subsequent filtration, stronger solutions up to 2.0 per cent., which are perfectly clear and stable, can be prepared. Solutions of these strengths are available for most purposes, but stronger solutions, up to 5 and 8 per cent. are sometimes required, particularly for intramuscular injections in the treatment of syphilis. For this purpose the addition of boric acid and of ammonia

is necessary, as has already been pointed out by the § proposed by the latter being as follows: 8 Gm. ast acid are heated with 70 Gm. of water to boiling, d dity that may remain, 25 Gm. of 20 per cent. solu added, and the flask is removed from the fire. A s contained in the asterol will separate and is filtered has cooled. A clear yellow solution is thus obtained composed by exposure to light, but will keep unchan it is preserved in the dark, or in brown or black bottl light is to reduce the mercuric parasulphophenylate metallic mercury, and the care with which this is eff objection made by some on the ground of its exces held by them to nullify its bactericidal value.—Pharm 1901, 527.

Guaiacol—Modern Compounds and Derivatives. compiled from the available literature a series of i which he gives a brief account of the history, for properties and therapeutics of a number of guaiacol have been introduced into modern therapeutics and decade, a comprehensive bibliography being appen. These compounds may be here briefly referred to as f

Guaiacol Biniodide, prepared and introduced as a antiseptic by Vicario, in 1892, is a reddish-brown pow a faint odor of iodine, readily soluble in alcohol, chl but insoluble in water or ether. It is obtained by tre sodium hydroxide in excess, purifying the resultant recrystallization, and adding to the aqueous solution o iodo-potassium iodide as long as a precipitate is forn being then thoroughly washed to free it from iodine. a shortening of the pocess, which consists in adding iodide solution direct to the crude sodium-guaiacol, di biniodide in alcohol, and purifying this by crystalliz precipitation with water.—Pharm. Rev., July, 1901, 30

Guaiacol Salol, first introduced by v. Heyden's succo taneously with benzosol (guaiacol benzoate), is obtain molecular quantities of *o*-guaiacol and sodium salicyl of phosphorus oxychloride, on the water-bath for s resulting compound, after washing with water and sodium carbonate solution, is purified by crystallizati zol or ether. It forms small colorless crystals devoid soluble in water, but readily soluble in alcohol, chloro zol. It melts at 65° C. Therapeutically it is used lik highly recommended as a remedy for phthisis in cases

tration of intestinal antiseptics is required. The dose is 1.0 Gm. several times per day.—Pharm. Rev., Aug., 1901, 347-350.

Guaiacum Valerianate, first prepared by Lehman (1896) and marketed under the name of

Geosote is obtained by Nenki and Heyden's methods of preparing salols, which are patented. According to Woodbury, however, this ester may be obtained as follows: Five parts of *o*-guaiacol are slowly heated with 7.5 parts of valeryl-chloride until the mixture boils, this operation being continued over the direct flame until the evolution of HCl ceases. The residual mixture is then washed with a 3 per cent. solution of sodium carbonate and extracted with benzol. The benzol is evaporated and the product dried. It is a pale yellow, oily, mobile liquid, of sp. gr. 1.037, insoluble in water, but readily soluble in alcohol, ether, benzol and chloroform. Its boiling point is given as 260° C., but when prepared from ordinary commercial guaiacol, esters are formed, according to Woodbury, that frequently boil as low as 240° C. Therapeutically geosote is considered a valuable remedy in tuberculosis and intestinal troubles. It is administered in doses of 0.2 Gm. from two to six times a day, and is considered absolutely non-poisonous and non-irritating.—Pharm. Rev., Aug., 1901, 352-354.

Gnaethol, a methyl derivative of *o*-guaiacol, was first introduced by E. Merck in 1894, but was not described in the journals until 1896, some confusion arising from the synonyms, "ajacol" and "thanotol," given respectively by v. Heyden and Ilosvay. The compound may be obtained by several methods, not necessarily described, but the products obtained show some differences in their physical characters. The compound is readily soluble in ether or alcohol, but requires 105 parts of water for solution. It possesses the properties of guaiacol from which it is prepared, but is claimed to be more prompt in its action. It is given in doses of 0.1 to 0.25 Gm.—Pharm. Rev., Sept., 1901, 399-403.

Guaiacol Cinnamate, first prepared by Knoll & Co. in 1890, under a patent, and marketed by that firm under the name of

Styracol, is obtained by heating molecular quantities of *o*-guaiacol and cinnamyl chloride in a water-bath for two hours, and crystallizing the resulting mass from alcohol. It forms white odorless and tasteless needles, which are perfectly stable, almost insoluble in water, but readily soluble in alcohol, chloroform, acetone and benzol. Therapeutically it is recommended as an internal antiseptic, the dose being 1.0 Gm. several times a day.—(Pharm. Rev., Sept., 1901, 403-406.)

Guaiacol Piperidine was introduced by E. Merck in 1897, being formed by the direct combination of molecule for molecule of piperidine and *o*-guaiacol. This new compound, which is marketed under the name of

Guaiaperol, occurs in small prismatic or flaky crystals, which are soluble

in most organic solvents, but only to the extent of 3.5 per cent. It is not a stable compound, and is readily split up into parts by mineral acids and alkalies. It melts at 79.8°C . It is recommended as a remedy in phthisis, being given in three times a day, gradually increased to 1.8 Gm.—Pharm. Rev., 1901, 495-497.

Guaiacol Succinate was first prepared by Dubois in 1894. It is doubtful whether this compound finds any use in medicine. The reagents are given by Dubois for the preparation of the compound, are by the condensation of two molecules of o-guaiacol and succinic acid—the simplest condensation agent being phosphorus chloride. Guaiacol succinate forms fine, silky-white crystals at 136°C . It is insoluble in water, slightly soluble in alcohol, easily soluble in chloroform or acetone, and very soluble in petroleum ether. Therapeutically it is said to be the “same” as guaiacol.—Pharm. Rev., Dec., 1901, 540-542.

Guaiaform (Geoform; Methylenediguaiacol). This was first prepared by Dr. G. H. Henning in 1898, and a short time later by Thoms. It is a condensation product of two mols. of o-guaiacol and 1 mol. of formaldehyde, but nothing definite is given by either of the discoverers concerning its preparation. Guaiaform is a white powder, odorless at first but acquiring a vanilla-like odor on exposure to air. It is soluble in alcohol or ether, insoluble in water and in petroleum ether. Containing 95.38 per cent. of guaiacol, it should prove a desirable substitute for this, being non-irritating and non-toxic, but actual information concerning its therapeutic value is wanting.—Pharm. Rev., Jan., 1902, 54.

The benzyl ester of o-guaiacol, which was first put upon the market in 1897 as a substitute for guaiacol, is known under the name

Brenzcin (=Pyrocain). This must however not be confused with the benzoyl ester of o-guaiacol, the so-called “benzosol,” it is a compound formed by the substitution of a benzyl group for the hydrogen of guaiacol. It is a colorless, tasteless and odorless body, stable in air, readily soluble in alcohol or ether, but insoluble in water, and possesses the therapeutic advantages over guaiacol with other derivatives of the latter, that it is non-irritating, and non-nauseating.—Pharm. Rev., Feb., 1902, 54.

Guaiacol Phosphate was first prepared by Dubois in 1894. It is a combination of 1 mol. of o-phosphoric acid with 3 mol. of o-guaiacol. It forms white crystalline plates, devoid of taste or odor, freely soluble in chloroform, toluol or acetone, soluble in strong alcohol, insoluble in alcohol, water, etc., and is perfectly stable. It is non-toxic and, containing a high percentage (89.4 per cent.) of guaiacol

* Thoms gives its solubility in water as “soluble in three parts of water.”

deserve a prominent place as a substitute for the latter.—Pharm. Rev., March, 1902, 114.

Guaiquin (Quinine Guaiacol-Bisulphonate).—This was first prepared by G. H. Schaefer in 1897, and is formed by the combination of molecule for molecule of guaiacol-sulphonic acid and quinine under the conditions of a patent. It is a yellow or drab-colored powder, bitter and sour to the taste, odorless, perfectly stable, and freely soluble in water, alcohol and dilute acids. Therapeutically, it is offered as an odorless, non-irritating and non-poisonous substitute for guaiacol, particularly applicable in phthisis and typhoid fever, and is given in doses of 0.19 to 0.65 Gm.—Pharm. Rev., April, 1902, 158.

Guaiacol Carbonate (Duotal).—This is the carbonic acid ester of guaiacol, and was introduced in 1891 by F. v. Heyden's successors, one year after the introduction of "benzosol." It may be thought of as formed by the condensation of two molecules of o-guaiacol and one molecule of carbonic acid, and is produced by the action of carbonyl chloride (COCl_2) upon sodium o-guaiacolate. As supplied under the commercial name of

Duotal, it is a white, microcrystalline powder, odorless, tasteless, imparting a sense of grittiness when taken into the mouth, insoluble in water, sparingly soluble in cold alcohol, in glycerin, or in the fixed oils, but readily dissolved by hot alcohol, or in ether, chloroform or benzol. It dissociates when treated with alcoholic KOH into potassium carbonate and o-guaiacol, of which it contains 91.5 per cent., but does not yield the characteristic guaiacol reaction with ferric chloride. Therapeutically, it possesses all the curative properties of creosote and guaiacol besides some distinctively its own, but none of the objectionable features characteristic of the substances named. The dose is from 0.20 to 1.25 Gm. three or four times *pro die*.—Pharm. Rev., May, 1902, 211.

Guaiacol Phosphite (Phospho-Guaiacol). This appears to have been first made and introduced in 1897, and is the product of condensation between one molecule of phosphorous acid and three molecules of o-guaiacol, obtained by permitting phosphorus trichloride to act upon an alkaline solution of the latter. The compound constitutes a white, crystalline powder, having scarcely any odor, but a sharp taste; it is soluble in water, very readily in alcohol, ether, chloroform, acetone, benzol, toluol and fixed oils, but only slightly soluble in turpentine and glycerin. Containing 92.25 per cent. of o-guaiacol, and devoid of irritant, nauseating or toxic effects, possessing solubility in water, and combining the physiological properties of phosphorus, this condensation product of guaiacol seems to deserve some attention by therapeutists. It has been injected to the amount of 8.0 Gm. into a dog of medium weight without deleterious effect—but death followed an injection of 16.0 Gm.—Pharm. Rev., June, 1902, 262.

Glycerin—*Reduction of Fehling's Solution on Pro-* Several carloads of glycerin obtained from one of the manufacturers, were examined by Robert C. Purcell and W found that aside of a trace of fatty acids it contained P. requirements. It also answered the U. S. P. test allowed to stand in contact with Fehling's Solution (from 12 to 16) in the cold, it reduced that solution. would probably be suitable for pharmaceutical purposes its use for preparing certain test solutions used for the urine, might lead to erroneous and unsatisfactory Journ. Pharm., Nov., 1901, 556.

Glycerophosphorous Acid and Glycerophosphites—*acters.*—A. and L. Lumière and F. Perrin have synthesized glycerophosphorous acid by treating a slight excess of phosphorus trichloride, keeping the mixture cool. The phosphorus trichloride is removed from the mixture by means of filtration from the AgCl thus formed, the glycerophosphorous acid is neutralized with a base, such as lime, and the excess of lime is removed by means of alcohol, or the original acid mixture may be neutralized with lime, evaporated at a low temperature and then distilled, which removes calcium chloride and glycerin, but leaves glycerophosphite. Free glycerophosphorous acid has been obtained since it tends to saponify on evaporating its solutions. It is soluble in water, the calcium compound occurs as a white precipitate, a white powder permanent in aqueous solution, and insoluble in alcohol. It rapidly decomposes at 100° C. when treated with HCl. The alkaline glycerophosphites are soluble in water, barium and calcium are insoluble in that solvent.—Pharm. Journ., 1901, 523; from Comptes rend., 133, 643.

Glycero-Arsenic Acid—*Difficulties of Preparation.*—Glycero-arsenic acid and arsenic acid readily react to form esters with the molecules of water, V. Auger finds that product is insoluble in the presence of water. It is therefore impossible to prepare arsenates from aqueous solutions of glycero-arsenic acid. The calcium salt, prepared by the method of Pagel is a white powder, glycero-arsenate, since it contains only a trace of organic matter. The salt may, however, be obtained by heating together in a vacuum of calcium acid arsenate, $\text{CaH}_2(\text{AsO}_4)$ with one molecule of water. This salt undergoes complete hydrolysis in the presence of water. Journ., March 29, 1902, 253; from Comptes rend., 14,

FIXED OILS.

Oil of Asparagus Seed—*Characters and Composition.*—*Seed*, under "Materia Medica."

Cotton Seed Oil—Objectionable Properties and Constituents.—In reply to a query, Prof. E. P. Hommell, calls attention to certain objectionable properties and constituents of cotton-seed oil. Owing to the absence of free fatty acids, it is unsuitable for preparing the ammonia liniment, while for camphorated oil it is objectionable, from a therapeutic standpoint, because "it lacks the emollient, penetrating and other medical properties which the physician desires when he exhibits this agent." With regard to the objectionable principle in cotton-seed oil, the author says that the crude oil contains an acrid resin and coloring matter which are non-saponifiable. When these are completely removed in the process of purification, any free acid present is also removed, leaving the oil unemulsifiable. Another objection to cotton-seed oil is the drying property, which it possesses to a considerable degree.—Proc. N. J. Pharm. Assoc., 1901, 56–58.

Oil of Mezereum Seeds—Characters and Composition.—W. Peters has obtained from 36 to 37 per cent. of a fixed oil from mezereum seeds (*semen coccognidii*). It proved on examination to be a drying oil, drying in thin layers to a varnish-like mass. It is greenish-yellow in color, has the sp. gr. 0.9237 at 15° C.; saponification number, 196–197; iodine number (18 hours' action of iodine solution), 125.9 to 126.3; acetyl acid number, 191.5; acetyl saponification number, 200.1 (= acetyl number, 17.6). Analysis revealed the presence of palmitic-, stearic-, oleic-, linoleic-, linolenic-, and isolinolenic-acids.—Arch. d. Pharm., 240, No. 1, Jan. 17, 1902, 56.

Expressed Oil of Strophanthus—Characters.—Bjalobrstzeski obtained 12.8 per cent. of oil from strophanthus seeds by expression, and then an additional 9.2 per cent. by extraction with ether. It is a tolerably thick oil, of a brownish-green color and narcotic odor; is rapidly bleached by sunlight, but non-drying; congeals at –6° C., and melts again at +2° C. Its sp. gr. is 0.9249 at 15° C.; acid number, 24.3; ester number, 170.3; saponification number, 194.6; iodine number, 101.6; Reichert's number, 0.9; Hehner's number, 94.1. It contains small quantities of volatile oil, physosterin, formic acid, and one other volatile fatty acid, its principal components being oleates, stearates and arachinates.—Pharm. Centralh., July 11, 1901, 427; from Chem. Ztg., 1901, 150.

Sunflower Oil—Chemical Examination and Constants.—F. Jean has subjected the seeds of the sunflower (*Helianthus annuus*) to chemical examination, with the following results: Sp. gr. at 15° C., 0.925; refractometer index, +22°; saponification number, 192 (in Mgm. KOH for 1 Gm. oil); iodine number, 124; Crismer's number, 104°; melting point of the fatty acids, 22° C.; non-saponifiable components, 0.72 per cent.; free acid (calculated as oleic), 3.102 per cent.; solubility in alcohol, 0.60 per cent. A characteristic reaction is obtained when a drop of sulphuric acid is dropped on a layer of the oil; a yellow spot is produced, which is sur-

rounded by a grey-blue shining zone exhibiting
Sunflower oil is useful on account of its drying pr
find use as a food product and as an illuminating
13, 1901, 563; from Annal. Chim. anal. appl., 6, 11

Oil of Walnuts—Sophistication.—Last year Ly
tioned in connection with oil of black walnuts (s
863) that some oils of walnuts supplied in the ma
coctions of various composition. He has now sub
nation. One of these, marked concentrated white
and was soluble in water. This proved to be dil
with a menthol-like body. Another sample proved
volume of oil of mirbane and four volumes of eth
stituents being easily separated by fractionation a
Amer. Journ. Pharm., Jan., 1902, 18.

CARBOHYDRATES.

Carbohydrates—Action of Hypochlorites.—Dr. W
ing occasion to mix some glucose with an excess o
served that the mixture at first became so moist tha
so as to form a plastic mass having the appearance o
it soon developed strong heat and water vapor was
explosion-like violence. After the reaction, a hard
which was readily pulverizable. It seemed of inter
nature of the reaction, and extending his experimen
of each of the four groups into which the carbohy
divided—the glucose ($C_6H_{12}O_6$), the saccharose (C_{12}
($C_{18}H_{32}O_{16}$), and the cellulose group ($C_6H_{10}O_5$), he c
may briefly be summarized as follows:

1. In the *glucose group* he subjected besides gl
levulose and galactose to the same reactions and exp
that by the action of hypochlorites in concentrated f
products of the reaction are oxalic acid, carbon dic
and water, while by the action of dilute solutions
decomposition products consist of carbon dioxide
water only.

2. The members of the *saccharose group*—embrac
sugar, maltose and cyclamose—react precisely like
group.

3. The members of the *melitose group*, melitose an
reaction when treated in the cold either with concentra
their dilute solutions; but when heated to a temperat
they were primarily converted into glucose, and then
sufficient excess of hypochlorite they were split up

bon dioxide (formic acid?) and water, or also only into carbon dioxide (formic acid?) and water, according to the concentration of the hypochlorite.

4. The member of the *cellulose group* behaved identically with the members of the third (the melitose) group of carbohydrates, conversion into glucose under the influence of heat preceding the final splitting up by the hypochlorite. Those experimented on were starch, dextrin, gum, glycogen and dextran.—Pharm. Ztg., Aug. 10, 1901, 635–637.

Lignin—New Reaction.—Mäule suggests a new reaction for lignified tissue in stems and other structures. The section is soaked for about five minutes in a 1 per cent. solution of potassium permanganate in distilled water, and then washed with water. The section is then soaked for two to three minutes in dilute hydrochloric acid; after again washing in water a drop of dilute ammonia solution is added to the section, when the lignified tissue becomes colored a deep red, the non-lignified remaining clear and colorless.—Pharm. Journ., March 29, 1902, 253; from Fünfstück's Beitr. f. Wissenschaft Bot., 4, 166.

Explosive Gun Cotton—Modification by Formaldehyde.—L. Vanino finds that when gun cotton is treated with formaldehyde solution of about 20 per cent., its detonating reaction is materially reduced and may even be completely obliterated, without apparent injury to its composition. Upon removing the paraformaldehyde deposited upon it by boiling the gun cotton in water, or by mechanical means, such as beating, the detonating properties of the explosive are completely restored.—Pharm. Ztg., Nov. 23, 1901, 935; from Ber. d. D. Chem. Ges., 1901, 1128.

Starch—Chemical Structure.—According to W. Synizowski the composition of pure starch is always perfectly uniform, with the empirical formula $C_6H_{10}O_5$. Its more resistant constituent, starch cellulose, is a reversion product subsequently formed from the dissolved starch. The substances formed by the action of boiling water, or of KOH, on starch-grains are products of the hydrolytic splitting up of starch. The simplest of these is a substance with the composition $C_{34}H_{56}O_{48}$, to which he proposes to give the name

Amylogen.—Furthermore, he suggests that the term dextrin should be limited to the products of the hydrolysis of starch—those which do not reduce Fehling's Solution, and are colored indigo-blue, being amylo-dextrins.—Pharm. Jour., Dec. 21, 1901, 692; from Bot. Centralbl, 87, 408.

Starches—Action of Diastase and Yeast.—G. H. Morris has studied the effects of diastase and yeast upon different starches in the presence of each other. He states that when yeast is allowed to act on a solution of starch conversion products in the presence of active diastase the quantity of matter fermented is greatly in excess of that which can be fermented

is neither degradable by diastase nor fermentable by yeast it is entirely fermented. He also shows that a similar action takes place when certain ungelatinized starch granules are submitted to the joint action of malt extract and yeast, the quantity of starch decomposed by the joint action being about three times that dissolved by malt extract alone. The increased action in the presence of yeast is not due to the removal of the soluble product, maltose, from the field of action, and the consequent greater activity of the diastase. No increased diastatic action takes place in the presence of yeast if the fermentative power of the latter is checked by chloroform, neither does any increase of action take place when the malt extract is submitted to fermentation, and the yeast cells removed, before the addition of the starch granules. Precipitated diastase behaves in the same way as cold water malt extract, but to a lesser extent. The combined action of diastase and yeast only occurs with those starches which are attacked in the ungelatinized form by diastase, such as barley or malt starch. The granules of potato starch are not acted on by diastase even in the presence of yeast.—Pharm. Journ., July 13, 1901, 33; from Proc. Chem. Soc., 17, 178.

Sugar Analysis—International Rules for Unifying Methods.—Dr. H. W. Wiley, Chief of the Bureau of Chemistry of the U. S. Dept. of Agriculture, has submitted copies of rules for unifying the methods of sugar analysis to numerous American chemists, with the request that they subscribe to the methods and promise to adhere to them—such promises having already been made by large numbers of European chemists. These rules may be consulted in Pharm. Rev., Jan., 1902, 24-25.

Sugars—Cobalt as a Test.—Referring to the recently proposed use of cobalt and nickel salts in place of copper salts as a test for sugars, by Sollman, Theodore W. Schaeffer records his experience with cobalt (as sulphate), which has yielded interesting and satisfactory results inasmuch as it serves to differentiate between saccharose and glucose. First of all the test should be performed with cold solutions, otherwise there may be a discrepancy in the results. The cobalt solution (cobalt sulphate) is first added to the solution of cane sugar or glucose and the sodium hydroxide is lastly added, otherwise the color reaction is a failure. Should the sodium hydroxide be added first to the cobalt solution and the cane sugar or glucose towards the last, no characteristic color reaction can be obtained. The deep-blue color occasioned by the addition of sodium hydroxide to a cane sugar solution containing cobalt, changes to an amethystine tint on the further addition of the alkali. This color reaction is the new test for cane sugar. Potassium hydroxide may be used instead of the sodium hydroxide. On heating the amethystine solution it assumes a

beautiful cobalt-blue color. The amethystine solution of cane sugar is decolorized by hydrochloric acid. In testing for glucose, add a solution of cobalt sulphate to the grape sugar solution, and then sodium hydroxide. A beautiful deep-blue color is produced which changes to a pale-green on standing for some time. This color reaction is the new test for glucose. The solution is decolorized on the addition of hydrochloric acid. The change to a deep-green may be facilitated by slightly warming the deep-blue solution and then stopping. On further heating, the same solution changes from a green to a pale-yellow and finally to a dark-red or "ruby-red," the color reaction of Sollmann, which, the author believes, is due to the action of potassium or sodium hydroxide.—Drug. Circ., March, 1902, 48.

Saccharose.—Occurrence in the fruits of *Paris quadrifolia*, L., which see under "Materia Medica."

Cellose—Production and Chemical Relations.—H. Skraup and J. König describe the sugar which is obtained as an acetate by the action of acetic anhydride and concentrated sulphuric acid upon cellulose. This cellose so obtained is identical with the acetate obtained a long time ago by Franchimont in the same way from Swedish filtering paper, and which he regarded to be eleven-fold acetylated triglycose. Furthermore, the cellose obtained by these authors is probably identical also with the sugar mentioned by A. Nastukoff as being produced by the hydrolysis of oxycellulose, which yields a hydrazone resembling mannose-hydrazone. The authors have obtained cellose from ordinary good German filter paper, from pure cotton fibre and pure linen. It is regarded as the simplest polysaccharide obtainable from cellulose, just as maltose is the simplest one obtainable from starch.—Pharm. Ztg., Nov. 23, 1901, 935; from Ber. d. D. Chem. Ges., 1901, 1115.

Glucose—Application of Phenylhydrazine as a Colorimetric Test.—A. B. Lyons discusses the phenylhydrazine test and its modifications for the direct detection of sugar. This test depends on the formation of a crystalline compound, phenylglucosazone, called for short ozazone, the method commonly practiced being that of von Iaksch. This, however, is too tedious and uncertain to commend itself in practice, and modifications possessing more or less value have therefore been suggested by Neumann, Margulis, Kowarski and Riegler, the latter, in distinction of the other modifications and the original test, being a colorimetric one, depending on the formation of a reddish-violet color in presence of traces of glucose if the sample is heated to boiling with a little phenylhydrazine and water, and then immediately mixed with a certain large excess of 10 per cent. sodium hydroxide solution. In line with this form of the phenylhydrazine test is the following observation of Dr. Lyons: If a solution containing sugar (glucose) is made alkaline with potassium hydroxide, a little phenyl-

hydrazine added and the mixture boiled one minute, a golden color and on neutralizing with acetic acid immediately or on cooling. If now ether is added and the mixture shaken, the latter clears up, while the ether becomes colored. In experimenting with simple solutions of glucose, the author was possible to determine the proportion of that substance in comparison; but when the experiment was repeated with glucose had been added, satisfactory quantitative results were not obtained. Better results were obtained if the urine was treated with lead acetate, but the author concludes that further experiments are needed to decide whether the test is available in urine analysis or quantitatively.—Pharm. Rev., April, 1902, 155-156.

Glycocoll—Solvent Action on Metallic Oxides.—A paper by W. Schaefer, describing glycocoll, $C_2H_5NO_2$, which is also known as glycine, glycolamic acid, amido-acetic acid, and sugar alcohol. W. Schaefer calls attention to one of its most characteristic properties, its great solvent powers which it exerts upon many metallic hydroxides. It unites with the alkalies and alkaline earth carbonates, liberating carbonic acid from their carbonates. The author finds that a hot solution of glycocoll readily dissolves the hydroxides of many metals. First an apple-green solution, which turns bluish as the metal is dissolved. Hydroxide of cobalt is rapidly dissolved by hot solution of glycocoll, forming a colored solution of considerable permanency. Hydroxide of nickel is at once dissolved by a hot solution of glycocoll. Hydroxide of iron is very soluble in the same menstruum. Hydroxide of zinc, freshly precipitated, behaves in a similar manner. Hydroxide of copper is rendered soluble by a hot solution of glycocoll. Mercuric hydroxide is dissolved by glycocoll, forming a transparent solution which turns dark on boiling, metallic mercury separating, and being produced at the same time. Mercurous oxide is dissolved by a hot solution of glycocoll, forming a solution which is more stable than that with mercuric oxide. Glycocoll, in a hot aqueous solution, dissolves cuprous cupric oxide, forming a beautiful blue solution. Sb_2O_3 , is slowly dissolved by it. The yellow oxide of arsenic is dissolved by it and the hydroxide is not rendered soluble. Litharge or lead oxide, PbO , readily dissolves in hot solution of glycocoll. Cadmium hydroxide, $Cd(OH)_2$, is readily dissolved by a hot solution of glycocoll. Stannous hydroxide is not so rapidly dissolved by a hot solution of glycocoll. UO_3 , dissolves very slowly in hot glycocoll solution. WO_3 , when boiled for some time in a hot solution of glycocoll, changes its yellow to a green color and the solution acquires a bluish tint. Auric trichloride, in solution, does not produce any color change with glycocoll, and the author finds that platinum chloride does not appear to be readily dissolved by it. Platinic chloride

to be disturbed by it, no color effect being produced. Platinic hydroxide appears to be scarcely affected by a hot solution of glycoll. A hot solution of glycoll dissolves freshly-precipitated cupric hydroxide, forming a liquid, possessing a beautiful, deep-blue color, from which cupric glycolamate crystallizes readily in dark-blue needles on cooling. If to a solution of cupric glycolamate some grape sugar be added, the copper becomes reduced to cuprous oxide when boiled for some time. The copper is not completely reduced to the suboxide, because the latter is somewhat soluble in boiling solutions of glycoll. Cane sugar produces no such an effect. Silver oxide dissolves in a boiling solution of glycoll. The silver glycolamate crystallizes readily. A hot solution of silver glycolamate is at once reduced to the metallic state by a solution of grape sugar in distilled water, a beautiful silver mirror being formed on the glass. Cane sugar does not reduce a solution of silver glycolamate when boiled.—Drug. Circ., May, 1902, 92.

ORGANIC ACIDS.

Oxalic Acid—Occurrence in the Animal Organism.—According to Cippollina oxalic acid is a normal constituent of both human and animal organs, the spleen containing the largest. While even here the quantity is small, it is nevertheless larger than the quantity secreted in the urine in the course of twenty-four hours. He finds that the spleen is capable of forming oxalic acid by the oxidation of uric acid.—Pharm. Centralh., July 25, 1901, 458; from Berl. Klin. Wchschr., 1901, No. 20.

Cerium Oxalate—Impurities of the Commercial Article and its Purification.—Dr. C. R. Böhm calls attention to the fact that the medicinal cerium oxalate does not consist of the cerium salt alone, but that to the extent of nearly 50 per cent. it contains the oxalates of lanthanum and didymium, with which it is naturally associated. The material largely used for its preparation is obtained as a by-product in the manufacture of thorium from Brazilian monazite sand, which contains besides about 18 per cent. of clay mainly cerite with small quantities only of yttrium earths. Working upon 80 kilos of commercial medicinal cerium oxalate, he found it possible to ascertain the presence of the various earths in the following proportions:

I. *Cerium-earth*s, 99.71 per cent. = cerium, 51.35; lanthanum, 24.16; didymium (neodymium, 11.96 and praseodymium, 12.24), 24.20 per cent. and traces of samarium.

II. *Yttrium earth*s, 0.2 per cent., composed of yttrium, ytterbium, erbium, terbium, and gadolinum, not quantitatively determined.

The author gives a method for preparing pure cerium oxalate from the commercial salt, which, omitting the details, is briefly as follows: The commercial oxalate is reduced to oxide by heating it to strong redness; the mixed oxides are dissolved in conc. nitric acid by the aid of heat,

ammonium nitrate, in quantity equal to that of the acid in water, is added to the clear solution of cerium nitrate concentrated until crystals begin to form, when it is allowed to crystallize. The crystals consist of cerium ammonio-nitrate liquor of lanthanum and didymium ammonio-nitrate and cerium salt. The cerium ammonio-nitrate, which forms the crystals, requires at least ten recrystallizations before it is free from the other earths, the recrystallization being effected by the oxalate precipitated from its solution only shows a faint yellowish tint. When this degree of purity is attained, the ammonio-nitrate in water, precipitated with potassium hydroxide, the precipitate washed with water, and redissolved in nitric acid (or hydrochloric acid in excess). From the faint acid solution, so obtained, the cerium oxalate is now precipitated by the addition of oxalic acid, washed with water and dried. So obtained, the residue on incineration should show only a very faint yellowish tint, the tenaciously adhering praseodymium—all other earths being absent. Pharm. Ztg., April 16, 1902, 297.

Formic Acid—Cheap Production.—M. Goldschmidt has proposed a method for the cheap production of formic acid, which is based upon powdered caustic soda with carbonic oxide under pressure. It is thus produced, and from this, in turn, formic acid for industrial use may soon be increased to such an extent as to be successfully with acetic acid. Furthermore, Goldschmidt is now developing a method for the cheap production of

Oxalic Acid, from the formate. Again, the formate method is well known, is readily produced when moderately concentrated formic acid or sodium formate are treated with concentrated sulphuric acid. Pharm. Ztg., Dec. 28, 1901, 1033; from Monatsh. f. Chem., 1902, 1033.

Glacial Acetic Acid—Necessity of Care in Storage.—A chemist storing some glacial acetic acid in an ordinary stoppered bottle for several months, found on re-examining it that it had lost some of its strength, as it was no longer miscible with an equal volume of oil of turpentine when first received, when it was found to fully conform to the requirements.—Pharm. Journ., Jan. 18, 1902, 42.

Glacial Acetic Acid—Conditions Determining its Solubility in Oil of Turpentine.—Thomas Dunlop, finding in the course of an experiment undertaken with the object of determining the availability of oil of turpentine in glacial acetic acid as a test for the purity of the acid, although the acid employed was of full specific gravity, failed to effect solution with an equal volume of oil of

attributed this failure to the kind of oil of turpentine in stock. Subsequent experiments with oils of undisputed quality, however, pointed out that the temperature at which the test was conducted was largely responsible for the success or failure, while atmospheric pressure had also some influence on the success of the test. Thus a sample which failed to dissolve at 18°C ., formed a clear solution at 20°C . Another sample which when tested was soluble volume for volume at 15.5°C ., a few days afterward had separated at 17°C ., inquiry showing that there was a diminution of barometric pressure on the day the separation occurred. The author, however, finds that glacial acetic acids of full strength respond to the test irrespective of temperature and pressure when it is used in the proportion of five parts to three of oil of turpentine. He concludes that if a sample of the acid answers the other characters and tests of the B. P., it should not be condemned because of its insolubility in an equal volume of oil of turpentine. In fact, the test is so unreliable that it should not be introduced into the B. P. (as suggested), and that where it already exists it should be deleted.—Pharm. Journ., April 26, 1902, 345.

Glacial Acetic Acid, B. P.—Insolubility in Oil of Turpentine Due to Deficiency in Strength.—P. W. Squire and C. M. Caines have inquired into the causes of the discrepancies concerning the reciprocal solubility of oil of turpentine and glacial acetic acid mentioned by different writers, and give the details of experiments made, from which they draw the following conclusions: 1. That the B. P. statement that oil of turpentine is soluble in its own volume of glacial acetic acid was clearly taken from U. S. P., 1890. 2. That the B. P. requires the acid to have a definite strength, whereas the U. S. P. mentions practically the same strength as the *minimum*. 3. Presumably, therefore, the U. S. P. acid may be stronger, and would include the acids of commerce which are stronger than the B. P. acid, and which form clear solutions with an equal volume of oil of turpentine. 4. Glacial acetic acid conforming strictly to the B. P., on the other hand, cannot be expected to form a clear solution with all samples of oil of turpentine under the conditions of the B. P. test, being deficient in absolute acetic acid. 5. With such samples of oil of turpentine as the authors have seen, the admixture of them with an equal volume of a sample of glacial acetic acid (temp. 58° – 62°F .) becomes a delicate test for a strength of 99.5 per cent. or stronger.—Pharm. Journ., June 14, 1902, 512.

Acetic Acid—Ready Method of Detecting Sulphurous Acid.—Lyman F. Kebler suggests that a ready method for detecting the presence of sulphurous acid in acetic acid is to add a drop of tincture of iodine to 10 Cc. of the acid. If pure, the acid is turned to a yellowish brown tint, but it is instantly decolorized if sulphurous acid is present.—Amer. Drugg., Dec. 9, 1901, 343.

Ammonium Acetate—Substitution by Acetimide.—the difficulty of preparing and preserving solid ammonia is very prone to liquefy and to dissociate, Lyman I seems to be the custom of certain manufacturers to call ammonium acetate is called for. *Acetimide* is characterized by its solubility in water and alcohol, by a mousy odor, by having a melting point of 82°C ., and by a boiling point of 222°C . Although the two substances resemble each other closely both chemically and physically, the uses of acetimide are as yet obscure, and the substitution is considered high-handed.—Amer. Journ. Pharm., Jan.

Potassium Acetate—Loss of Water at 110°C .—F. A. Upsher Smith finds that on heating potassium acetate at 110°C ., there is a loss of water, but that the solubility figure is practically unaltered, calculated on the weight of residue after heating for two or for sixteen hours ($=1$ in 0.419).—Pharm. Journ.

Calcium Salts of the Acetic Acid Series—Solubility.—F. A. Upsher Smith has determined the solubilities of the calcium salts of the acetic acid series, in order to obtain further information as to the lessening solubility of calcium salts with increase of the number of carbon atoms. Formate is anhydrous when in contact with its saturated solution, showing a simple ascending curve of solubility, while the calcium salts of the other acids of the series contain water of crystallization and show a solubility with rise of temperature until a minimum point is reached, after which the solubility increases. Of the salts of the series, calcium acetate changes from one crystalline state to another at 100° , whilst both calcium isobutyrate and calcium valerate show double curves. With the exception of calcium formate, the other salts have been examined, when in contact with their saturated solutions at 100° , consist of crystals which contain 1 molecule of water. The solubility of the normal acids increase in solubility from formate to acetate, then decrease quickly with the growth in the number of carbon atoms, the salts of the iso-acids being more soluble than the corresponding normal acids.—Pharm. Journ., Mar. 1890. Proc. Chem. Soc., 18.

Lead Acetate—Volumetric Determination with Oxalic Acid.—F. A. Upsher Smith finds the method of Hempel for the volumetric determination of lead acetate, as proposed by Sutton, to be available under certain precautions, and more accurate than the B. P. method with volumetric sulphuric acid. It depends on the precipitation of the lead as oxalate by the addition of an excess of oxalic acid employed by means of permanent solution. The method being carried out as follows: 20 Cc. of a saturated solution of lead acetate was mixed with 20 Cc. of acetic acid, and 40 Cc. of

solution. The whole was acidified with sulphuric acid, made up to a liter with recently boiled and cooled distilled water, boiled, and the clear liquid titrated with $\frac{N}{10}$ permanganate while at a temperature of about 60° C. It is necessary to use heat in order to start the reaction and ensure its completion. According to Sutton the method is not absolutely accurate, owing to the slight solubility of the precipitated lead oxalate, but with careful manipulation the error need not exceed 1 per cent. He also states that the error is much increased by the presence of ammoniacal salts. In titrating oxalic acid with permanganate the reaction is slow at first; the characteristic color of the permanganate, however, afterwards passes through different shades of brown and yellow, ultimately disappearing and leaving a water-white solution. The order of titration should never be reversed.—Pharm. Journ., Feb. 22, 1902, 142.

Trichloroacetic Acid—Characteristic Reactions.—A. Clermont finds that when equal numbers of molecules of alcohol and tri-chloroacetic acid are mixed, and to this mixture a molecular proportion of monohydrated sulphuric acid is added, the heat evolved is considerable—sufficient to allow of the immediate formation of the trichloroacetic ether. After some minutes the liquid becomes opalescent, and after the addition of four times its volume of cold water, the drops coalesce and a distinct layer is formed, composed of ethyl-tri-chloroacetic ether. This can be separated and washed, and, on the addition of its own volume of ammonia, is rapidly converted into trichloroacetamide—a white crystalline body. The latter substance can be dried in the air and then sublimed, when it appears in brilliant plates and looks like naphthalene. These reactions, characteristic of trichloroacetic acid allow of its qualitative identification in a very short time.—Chem. News, Nov. 29, 1901, 268; from Compt. rend., Nov. 4, 1901.

Acetone—Compounds Produced by Hypophosphorous Acid.—C. Marie finds that crystalline hypophosphorous acid when heated with acetone has apparently no action; but if the solution is kept boiling for some time, the temperature rises regularly, the liquid becoming brown and viscous. On cooling, crystals of a monobasic acid separate out, which have the formula $2\text{PO}_2\text{C}_3\text{H}_6\text{O}$, while the filtrate separated from them yields a bibasic acid—so characterized by the insolubility of its lead salt, having the composition $\text{PO}_3\text{H}_3\text{C}_3\text{H}_6\text{O}$.—Chem. News, Aug. 16, 1901, 84; from Compt. rend., July 22, 1901.

Benzoic Acid—Sophistication of the Natural Acid.—Lyman F. Kebler has recently examined a number of English samples of natural benzoic acid and found them all to give the reaction for chlorine. This apparently substantiates the rumor that manufacturers are accustomed to subliming artificial benzoic acid over gum benzoin or gum benjamin, so as to obtain the aroma so characteristic of the natural product. It is barely possible that natural benzoic acid from certain sources does contain chlorine, but

until this has been proven we must consider all natural benzoic acids containing chlorine to be more or less contaminated with the artificial product.—Amer. Drugg., April 28, 1902, 215.

Benzoic Acid and Benzoates—Determination in Foods.—J. de Bevans recommends a process for the determination of benzoic acid or benzoates in food products which is based on the formation of aniline blue when benzoic acid reacts with a solution of hydrochloride of rosaniline in aniline oil. The substance under examination is extracted with water, the filtered solution—or, in the case of beer or wine, 200 Cc. of these—is treated with a few drops of diluted sulphuric acid in order to decompose any benzoate present, and the liquid is shaken out with three portions, of 50 Cc. each, of a mixture of equal parts of ether and petroleum ether. The filtered ethereal solutions leave benzoic acid as residue when evaporated at a moderate temperature; but this residue may also consist of saccharin or of salicylic acid if these are contained in the food—saccharin manifesting itself by its sweet taste, while salicylic acid is revealed by its well-known reaction with ferric chloride. These being absent, the residue of evaporation is added to 0.5 Cc. of a solution of a 0.02 per cent. solution of rosaniline hydrochloride in aniline oil, contained in a dry test-tube, and the mixture is heated on a sand-bath for 20 minutes until it boils (at 184° C.). In the presence of benzoic acid, according to its quantity, the red solution will assume a more or less violet-blue color. The pure blue coloring matter may then, for the purpose of control, be obtained in alcoholic solution, by adding hydrochloric acid in slight excess, diluting with water, collecting the precipitated blue coloring matter on a filter, washing it with water, and dissolving it in alcohol.—Pharm. Ztg., Dec. 7, 1901, 973; from Journ. de Pharm., 1901, No. 10.

Sodium Benzoate—New Assay Process.—According to F. M. Alcock, the official (B. P.) process for assaying sodium benzoate—ignition of the sample and titration of the residual sodium carbonate—is not entirely satisfactory. He finds that concordant results can be obtained, even by the inexperienced, by the following method: 0.5 Gm. of sodium benzoate and 0.5 Gm. of ammonium chloride are dissolved in 10 Cc. of distilled water, the solution is evaporated to dryness, and gently ignited. The residual sodium chloride, the purity of which depends on the purity of the sodium benzoate tested, is then titrated with $\frac{N}{10}$ volumetric silver nitrate.—Pharm. Journ., April 5, 1902, 274.

Ammonium Benzoate—Loss of Weight on Desiccation.—F. A. Upsher Smith observes that the evaporation of ammonium benzoate in aqueous solution is liable to be attended by loss. According to Berzelius when the solution is evaporated an acid salt is formed owing to volatilization of part of the ammonia; this led him to doubt whether a perfectly neutral sample could be obtained. On the other hand, when an excess of alkali

is present, the salt is deliquescent. In determining the strength of the solution for taking the solubility weighed quantities of the solution were dried over sulphuric acid in a desiccator attached to a pump whereby a partial vacuum was obtained. The loss in weight, when all apparent moisture had disappeared, was very gradual. By way of example particulars of one determination will be given. Operating on 1.7906 Gm. of saturated solution the loss was as follows :

Time.	Loss.	Corresponding Solubility.
After 1 day	1.1960 Gm.	—
After 5 days.....	1.4924 Gm.	1 in 5.005
After 6 days.....	1.4929 Gm.	1 in 5.036
After 9 days.....	1.4941 Gm.	1 in 5.039
After 17 days.....	1.4964 Gm.	1 in 5.086

It is seen, therefore, that while the loss is continuous it is too slight to materially affect the solubility figure of the salt.—Pharm. Journ., Feb. 22, 1902, 142.

Silver Benzoate—Solubility in Alcohol.—C. Liebermann has investigated the solubility of silver benzoate, which, erroneously it appears, is in some works stated to be readily soluble in alcohol. He finds that one part of the salt requires 5910 parts of cold or 2150 parts of boiling alcohol for solution.—Pharm. Ztg., May 7, 1902, 355 ; from Ber. d. D. Chem. Ges., 1902, No. 5.

Benzyl-Esters of Benzoic, Cinnamic and Salicylic Acids—Preparation by the Humid Method.—Dr. F. Evers, in connection with his recommendation of substituting the benzyl-esters of benzoic and cinnamic acids for storax and balsam of Peru (see *Storax* under "Materia Medica"), which they probably replace perfectly as medicinal agents, calls attention to the fact that these esters may be prepared without interference with the recent patents for their preparation by employing the humid method, which may be outlined as follows : Molecular quantities of the sodium salts of the respective acids and of benzyl chloride with strong alcohol in a flask connected with a reflux condenser until the liquid does not evidence turbidity on cooling. The operation may, however, and preferably be conducted under pressure in an autoclave, because of the inconvenient bumping of the liquids. The alcohol is distilled from the product of the reaction, and the residue is then heated to about 180° C. in order to distill off any unchanged benzyl chloride, the presence of which in the ester is strongly irritating when the latter is applied locally. The ester, if liquid, is then filtered to remove residual sodium chloride, any unchanged salt of the organic acid being also retained upon the filter. If the ester, on the other hand, is a solid, it may be freed from sodium chloride and undecomposed organic salt by simply washing with water, or by solution in a suit-

able solvent, filtration, and evaporation (distillation vessels must be avoided, since even traces of ferri difficulty removed, forming with benzyl chloride products.—Pharm. Ztg., Dec. 21, 1901, 1015.

Benzonaphthol (Betanaphtholum Benzoicum)—(Swiss Pharmacopœia Commission characterizes ben White needless or crystalline, odorless and taste reaction. Insoluble in water and dilute soda sol alcohol, chloroform and hot ether. Melting point 1 thol be heated with alcoholic potassa solution, a cl on addition of water, in which the odor of benzoic be recognized and from which on acidification a m and β -naphthol is precipitated. On adding alcohol solution of benzonaphthol in chloroform, a blue col time, which increases on heating. In conc. sulphu dissolves with a yellow color, becoming darker on the solution in sulphuric acid with a large quantit saturating it with ammonia a vivid green fluoresce holic solution which has been mixed with an ec nitric acid, must not evidence a red coloration on nitrate (absence of free β -naphthol). (The mixtu with celerity, because violent reaction results after a on platinum foil, benzonaphthol burns without lea shaken with water it yields a filtrate, which is not al or barium nitrate.—Pharm. Ztg., March 19, 1902, 28

Sodium Lactate—Extemporaneous Preparation of. —Maureau recommends the following simple proce per cent. solution of sodium lactate: Heat 30 Gm. c water bath, add gradually, in small portions at a t sodium bicarbonate, allow to cool, and add to the s weight of water. Then heat the solution nearly to b it exactly, either with sodium bicarbonate or lactic quired, until it is neutral to litmus. The solution s changed for a long time.—Pharm. Ztg., May 7, 1902, Pharm., 1902, No. 4.

Citric Acid—New Process of Manufacture.—Dr. J the manufacture of citric acid from lemon juice as car States, represents an important branch of industry, chemical process which has undergone but little cha since its introduction. It is well known that the end this process offers special difficulties in decoloratio crystallized citric acid frequently exhibits the brownis lemon juice, besides containing an appreciable quanti

use of crystallizing pans which are commonly made of this metal. Moreover, the yield of the method in common use is unsatisfactory, the loss in citric acid frequently amounting to from 15 to 20 per cent. of that originally present in the juice, while the operations involved offer great difficulties which can be successfully overcome only by an experienced operator. The following method, claimed by Dr. Ohley as his own invention, affords a much greater yield in citric acid than the old one, and is much more readily performed. It consists of the following observations and manipulations :

When a concentrated solution of calcium chloride is gradually added to a solution of sodium citrate, the precipitate at first produced redissolves, but when agitated it suddenly forms a magma which becomes crystalline on the application of heat. It will be seen when considering the reaction which takes place, that besides the tricalcic citrate produced in this manner, a solution of sodium chloride is also formed, which can be readily removed by filtering and subsequent washing with hot water, the reaction occurring in accordance with the following equation: $3\text{CaCl}_2 + 2\text{Na}_3\text{C}_6\text{H}_5\text{O}_7 = \text{Ca}_3(\text{C}_6\text{H}_5\text{O}_7)_2 + 6\text{NaCl}$. Briefly then, the process consists in diluting the concentrated lemon juice, which should be supplied as *fresh* as possible, with twice its volume of water, filtering after standing over night to remove albumen, then adding a calculated quantity of calcium chloride, followed by solution of sodium hydroxide, gradually added, until the solution is exactly neutral, when, upon stirring, a magma of calcium citrate is quickly deposited. From this the sodium chloride formed is readily removed by hot water, and it is then decomposed by the calculated quantity of sulphuric acid. Further details must be consulted in the original. The main advantages of the new process are: convenience, a yield approximating to theoretical figures, and decidedly superior purity of product.—Pharm. Era, Dec. 19, 1901, 706–707.

Potassium Citrate—Test for Sulphates, Chlorides, &c.—The B. P. requires that potassium citrate shall give only the slightest reactions for chlorides and sulphates. F. A. Upsher Smith finds that in applying these tests the best plan is to ignite the salt in an open dish, oxidize the residue by adding concentrated nitric acid and continuing the application of heat until combustion ceases. The residue is then extracted with hot water, filtered, and the filtrate examined for chlorides and sulphates. These precautions are advisable because certain organic substances tend to prevent the precipitation of inorganic substances by ordinary reagents.—Pharm. Journ., Feb. 22, 1902, 142.

Ferri et Ammonii Citras, B. P.—Composition of Commercial Samples.—W. Lyon has found commercial ammonio-citrate of iron to vary from the official requirements, but is inclined to attribute this variation to an excess of ferric hydroxide present in the citric solution before the ammonia is added, the B. P. failing to specifically state that the citric

solution is to be decanted from the excess of hydroxide. He has subjected four commercial samples, and one of his own make, to examination, with results as follows :

Samples.	1.	2.	3.	4.	Own Make.
Ferric oxide by incineration.....	37.5 per cent.	37 per cent.	37.5 per cent.	32.5 per cent.	33.5 per cent.
Ferric oxide by KHO method	36 per cent.	36 per cent.	37 per cent.	32 per cent.	33 per cent.
Sulphates	Present.	Present.	Present.	Absent.	Absent.
Tartrates	Absent.	Absent.	Absent.	Absent.	Absent.
Alkali	Absent.	Absent.	Absent.	Absent.	Absent.
Soluble in cold water(?)..	Slowly.	Slowly.	Quickly.	Quickly.	Quickly.

—Pharm. Journ., June 21, 1902, 581.

Methylene-Citric Acid—Preparation and Properties.—Dr. W. Sternberg has succeeded in preparing methylene-citric acid by heating together 200 Gm. citric acid and 30 Gm. paraformaldehyde at 140° to 160° C., until the originally clear solution begins to become turbid, owing to the separation of crystals. The product of the reaction is now poured into a capsule, allowed to cool, the congealed mass dissolved in 300 Gm. of water, and set aside to crystallize. The crystals are washed on a suction filter and dried—the mother liquor and washings yielding an additional crop. Methylene-citric acid crystallizes in stellate groups of prisms, which are browned at 190° and melt, under decomposition, at 205° C. It is readily soluble in hot water, in about 40 parts of cold water, readily soluble in alcohol and acetone, but insoluble in ether. It may be boiled with water or diluted acid without decomposition, but is easily decomposed by carbonated and caustic alkalies. It produces a sparingly soluble silver salt, having the composition $\text{Ag}_2\text{C}_7\text{H}_6\text{O}_7$.—Pharm. Ztg., Dec. 18, 1901, 104.

Dimethylene-Tartrate—Preparation and Properties.—Dr. W. Sternberg has prepared dimethylene-tartrate, $\text{C}_6\text{H}_8\text{O}_8$, by heating 15 Gm. of tartaric acid and 6 Gm. trioxymethylene in an oil bath at 140°–150° C., in a flask provided with a reflux condenser, until a clear liquid was produced. The thick, colorless, syrupy product obtained on cooling was gradually mixed with 30 Gm. concentrated sulphuric acid at a temperature of 60°, observing that a temperature of 80° was not exceeded, so as to avoid carbonization. It was then cooled under continued agitation, washed ice being added, and the tartrate then separated in the form of white powdery crys-

tals, which were collected and washed on a suction filter. Finally, the product was recrystallized from alcohol. So obtained, dimethylene-tartrate forms fine, colorless needles, which melt at 120° C. without decomposition. It is volatilized and sublimed at a moderate temperature, and boils at 120° C. While easily soluble in warm water, it is decomposed, a strong aldehyde odor manifesting itself. On cooling a portion of the undecomposed tartrate crystallizes out, while the mother liquors retain only tartaric acid pure and simple. The author also endeavored to prepare

Methylene-Tartaric Acid by the interaction of 40 per cent. formaldehyde solution and tartaric acid, but failed to obtain it from the smeary, brown product of the reaction (see also Methylene-citric acid).—Pharm. Ztg., Dec. 18, 1901, 1003–1004.

Cream of Tartar—Adulteration with Calcium Superphosphate.—J. White calls attention to a sample of cream of tartar composed of an admixture of potassium acid tartrate, calcium superphosphate and rice starch, probably in the approximate proportions of 64, 31 and 5. The result is a combination, which, when titrated directly, gives an acid figure which calculated as $\text{KHC}_4\text{H}_4\text{O}_6$, indicates over 90 per cent. of that body. The opinion is expressed that in addition to direct acidimetric determination, the official test should include the alkalimetric titration of the soluble ash, which, as has been stated by A. H. Allen, should be exactly equivalent to the direct acid titration.—Pharm. Journ., May 24, 1902, 430; from Analyst., 27, 118.

Antimonii et Potassii Tartras—Commercial Quality.—Lyman F. Kebler observes that, although it ought not to be difficult to prepare pure tartar emetic, there seems to be some difficulty, inasmuch as more than one-half of the samples examined are contaminated more or less with impurities. An examination of 20 samples by the Pharmacopœia standard gave the following results: Percentage purity of ten samples: 101.74, 100.92, 102.04, 103.20, 101.24, 96.81, 100.21, 101.61, 101.37, 101.31. All these samples contained more or less calcium sulphate and chlorides. One sample, coming from Italy, also contained strontium sulphate. The percentage purity of seven other samples ran as follows: 101.24, 104.57, 104.25, 102.50, 100.9, 99.77, 100; all these samples tested up very well, but the remarkably high percentage of purity of several samples was unusual. From these results it becomes evident that in all probability the difficulty lies in the manufacture of the article, more antimony being present in one preparation than in another.—Amer. Drugg., Mar. 24, 1902, 161.

Ferrum Tartratum, B. P., 1898—Improved Formula.—W. Lyon has found that the official tartrated iron, though readily soluble when first prepared, soon diminishes in the rapidity of its solution in water and dissolves very slowly after several months. His experiments lead him to the belief that if the acid potassium tartrate is replaced by sodium-potassium tar-

trate, a preparation will result that will retain its time. He accordingly recommended the following—otherwise adhering to the official process a ferric sulphate, 300 Cc.; solution of ammonia, potassium tartrate, 176 Gm. The preparation contains 28 per cent. of ferric oxide, and had 1 (up to the period of the author's paper) for Journ., June 21, 1902, 530.

Salicylic Acid—A Natural Constituent of Str
“Materia Medica.”

Isosalicylic Acid—Formation and Characters.
by the action of aqua regia on an alcoholic solution of salicylic acid, which he names isosalicylic acid. It is obtained in prisms, which melt at 154° C., but may be sublimed. It shows the same color reaction with ferric salts as salicylic acid, and with the alkalies, and when distilled yields an isophenol which is white at first, rapidly becoming reddened by acids, but again decolorized on boiling. Pharm. Ztg., April 26, 1902.

Bismuth Salicylate—Difficulty to Obtain a Pure Sample.
B. P. Requirements.—The B. P. requires that bismuth salicylate should not yield any free salicylic acid to 90 per cent. of its weight. Chas. R. Tichborne, County Analyst, Longford has written that he has been unable to obtain a sample that would respond to this requirement, which is evidently too stringent. Even when he asked a manufacturer that he could supply a strictly B. P. sample, he was unable to obtain a sample that would respond to this requirement.—T. Pharm. Ztg., 1901, 437.

Bismuth Salicylate—Preparation of a Stable Salt.—After reviewing the various methods that have been proposed for the preparation of bismuth salicylate, all of which yield an unstable compound, Paul Thibault describes a method which yields a well defined and stable crystalline salt. The formula $(C_7H_5O_2)_3Bi_2O_3$: 15 Gm. of crystallized bismuth subnitrate precipitated in nitric solution by an excess of caustic soda, washed, dried, and boiled, the whole of the amorphous, white, hydrate is converted into yellow crystallized anhydrous oxide; it is then mixed with 10 grams of salicylic acid rubbed up with 200 grains of sugar. The whole is then left on the water-bath for some time, and fairly long one to complete on account of the insolubility of the salt and of its constituents. When at last it is tested, it is decided by making sure by means of the microscope that the more opaque, yellow needles of anhydrous oxide

thoroughly washed with cold alcohol, and dried in the oven. The very well crystallized bismuth salicylate so obtained is undecomposable by cold alcohol, ether, or at a temperature of 140° C., and acts as a *true* salt of bismuth.—Chem. News, Dec. 27, 1901, 310; from Bull. Soc. Chim., xxv, No. 16.

Mercuric Salicylate—Solubility in Solution of Sodium Chloride.—Larin finds that *freshly* prepared mercuric salicylate is readily soluble in a solution of sodium chloride and that a 20 per cent. solution may thus be obtained that has remained unchanged during 2 months. Old preparations have a strong acid reaction on litmus and are no longer soluble. The salt is practically insoluble in water and in chloroform, but soluble in 45 p. of alcohol (95 per cent.) and in 100 p. of ether.—Pharm. Centralh., Aug. 29, 1901, 536; from Chem. Ztg., 1901, Rep. 193.

Phospho-Mannitic Acid—Preparation and Properties.—Portes and Premier, who are well known on account of their work in connection with the glycerophosphates, have made a further series of experiments in order to see if phosphoric acid is equally efficacious in the etherification of other polyatomic alcohols, such as mannite. They have succeeded to prepare phospho-mannitic acid satisfactorily and in a pure state as follows: Three molecular proportions of mannite having been dissolved in 500 Cc. of water for every 500 grammes) are heated on a water-bath for seven days. After the reaction is complete the mass is dissolved in cold water. The solution is treated with subacetate of lead, which precipitates free phosphoric and phospho-mannitic acids, leaving the excess of mannite in solution. The precipitate is well washed, then suspended in water, and treated with hydrogen sulphide. Excess of this is removed by a current of air, and barium carbonate, and, finally, brayta-water is added, until complete precipitation of the phosphoric acid. The phospho-mannitate of barium remains in solution and can be filtered off. If prepared now, it is found to be somewhat impure, but can be purified by decomposing it with sulphuric acid, reconvertng into the barium salt, and precipitating with alcohol. Thus prepared the barium salt is a white powder, of crystalline nature, soluble in cold water, partially decomposed by boiling water, insoluble in alcohol, oils and ether. The free acid is a gummy mass. Whether this new class of phosphoric-acid compounds will play as useful a part in medicine as the glycerophosphates have remains to be seen.—Chem. and Drugg., June 14, 1902, 922; from Journ. de Pharm. et de Chem., 1902, 457.

Tannin—Quality of Different Commercial Sorts.—Lyman F. Kebler furnishes the following data which give a fair idea of the medicinal tannin available at the time of his communication:

Number.	Per cent. of Tannin.		Per cent. of moisture. 100° C.	Concentrated aqueous solutions.	Per cent. of water soluble matter in tannin dried at 100° C.
1.....	78.96 L. ¹	75.62 H. P. ²	7.13	Turbid.	92.72
2.....	84.24 L.	83.96 H. P.	8.45	Turbid.	90.09
3.....	81.36 L.	79.36 H. P.	...	Turbid.	91.63
4.....	80.10 G. A. ³	75.00	....	Turbid.	.....
5.....	.....	85.93	10.00	Turbid.	88.40
6.....	82.18 G. A.	.....	....	Turbid.	90.00
7.....	80.24 G. A.	.....	11.69	Turbid.	86.00

¹ L. = Lowenthal's method.² H. P. = Hide powder method.³ G. A. = Gelatin alum method.

All of the above samples gave a perfectly clear solution in glycerin. From the above data it can readily be seen that the actual amount of material insoluble in water is very small, although it looks like a large amount, when actually testing.—Amer. Drugg., Dec. 9, 1901, 344.

Tannin—Substitution by Finely Powdered Nut Galls.—Robert C. Pursel and Willard R. Graham have assayed a sample of commercial tannin, offered at an abnormally low price, and found it to contain only 57.80 per cent. of tannin. The result confirmed, which its appearance indicated, that the so-called tannin was, pure and simple, finely powdered nut galls.—Amer. Journ. Pharm., Nov., 1901, 556.

Tannic Acid—Substitution by Powdered Chinese Galls.—Lyman F. Kebler has also observed that powdered Chinese nut galls has been supplied for tannic acid, a substitution which is readily detected by any one familiar with the odor of these galls—otherwise by the considerable amount of matter insoluble in water, or by a microscopic examination.—Amer. Journ. Pharm., Jan., 1902, 14.

Mercurous Tannate—Preparation of Uniform Composition.—According to Zdarek, mercurous tannate of uniformly the same composition is obtained as follows: Triturate 20 Gm. of freshly prepared mercurous nitrate, moistened with a few drops of water, to very fine powder, then add 12 Gm. of tannic acid and 20 Gm. of water, and continue the trituration half an hour. The insoluble compound formed is then washed repeatedly with distilled water by decantation until the washings are free from nitric acid; the moist residue is expressed and dried at about 30° C. So obtained, mercurous nitrate contains an average of 55.71 per cent. of Hg., and corresponds to the formula $C_{14}H_8Hg_2O_9$ (= 55.57 per cent. Hg). The prolonged and intimate trituration is absolutely necessary to secure a product of constant composition.—Pharm. Ztg., Feb. 1, 1902, 91; from Pharm. Post, 1901, No. 52.

Bromo-Tannin—A New Condensation Product.—A process for preparing a new condensation product of tannin and bromine has been recently patented in Germany. It consists in adding 15 parts by weight of bromine

to a solution of 15 parts by weight of tannin in 75 parts by volumes of 95 per cent. of alcohol, at the ordinary temperature. The solution becomes strongly heated during the reaction which results in the formation of tannin-dibromide. On now adding to the clear solution 7.5 parts by volume of 40 per cent. formaldehyde solution, and allowing the mixture to stand one hour, condensation of the bromide results, and the new compound separates out on the addition of 350 parts by volume of concentrated hydrochloric acid. The precipitate is transferred to a suction filter, washed with water, and dried in the air. It contains 25 per cent. of bromine, and is almost tasteless.—Pharm. Centralh., Jan. 2, 1902, 8; from Chem. Ztg., 1901, 1017.

Iodo-Tannin Compounds (so-called)—*Chemical Character*.—Frederick B. Power has investigated the chemical character of the so-called iodo-tannin compounds, which have for many years been assumed to be present in certain medicinal preparations, such as krameria, cinchona, etc., containing a large tannin content, to which iodine has been added with the object of rendering it more readily assimilable than when exhibited in the form of alkali iodide, and because of the freedom of the iodo-tannin compound from the unpleasant effects which sometimes attend the use of iodides. It has been assumed by the promoters of these different preparations that the iodine enters into direct combination with the tannin; others assume, on the basis of experiments, that a soluble and stable combination of unaltered tannin and hydriodic acid is found. Dr. Power, including the action of iodine upon gallic acid in his investigations, has now obtained results from which it would appear that true or definite compounds of iodine with either tannic or gallic acid cannot be formed by the simple interaction of these bodies in the presence of water, for, as might be expected, under these circumstances the iodine acts simply as an oxidizing agent. The resulting products, therefore, contain the iodine in the form of hydriodic acid, associated with more or less unaltered tannic or gallic acid, and the oxidation products of the latter. It follows that, unless the physiological action of tannin is desired conjointly with that of the iodine, there is no necessity for its use as a means of effecting the chemical change resulting in the so-called dissimulation of the iodine. In place, however, of the various other expedients that have been proposed for attaining this result, it would be more rational, from the standpoint of accuracy in medicine, to employ a preparation containing a definite amount of hydriodic acid, for which a syrup is probably best adapted, the strength and dosage of which can so easily be controlled.—Trans. Brit. Pharm. Conf., 1901, 466–476.

In contrast to the observations of Power, O. van Schoor maintains the original opinion that in

Iodo-Tannin Preparations, the iodine is directly combined as such with the tannin, that the tannin exerts simply a physical action, and that it combines with the iodine in very variable proportions, slowly at the ordi-

nary temperature, more rapidly and complete under the influence of heat. The presence of sugar or honey further accelerates the disappearance of the iodine, while the presence of alcohol retards the combination. Nevertheless, the author appears to consider the use of alcohol to be indispensable in the preliminary stages of the preparation of the iodo-tannin compounds, as is evident from the following formulas of van Schoor :

Syrupus Iodo-Tannicus : Dissolve 2 p. of iodine in 20 p. of alcohol, and 2 p. of tannin in 20 p. of water ; mix the two solutions, add 1000 p. of simple syrup, and heat the mixture nearly to boiling, until it no longer gives the iodine reaction with starch paste ; then filter.

Vinum Iodo-Tannicum is prepared in the same way, using 1.5 p. each of iodine and tannin, 15 p. each of alcohol and water to dissolve them, and 1000 p. of a suitable sweet wine, or wine sweetened with sugar.—Pharm. Ztg., Mar. 5, 1902, 179 ; from Journ. de Pharm., 1902, No. 1.

Gallic Acid—Derivatives.—F. B. Power and F. Shedden have studied various derivatives of gallic acid. Ethyl dinitrodiacetylgallate, $C_6(NO_2)_2(C_2H_3O_2)_2OH.CO_2C_2H_5$, was prepared by the nitration of triacetylgallate (m. p. $133^\circ C.$). It forms lemon-yellow needles (m. p. $165^\circ C.$). Ethyl dinitrotriacetylgallate, $C_6(NO_2)_2(C_2H_3O_2)_3CO_2C_2H_5$, was prepared from the preceding compound by the action of acetic anhydride. It forms colorless needles (m. p. $145-146^\circ C.$), which gradually become yellow. Its cold alcoholic solution gives no reaction with ferric chloride, but, on boiling, a bluish-green color is produced. When an alcoholic solution of ethyl dinitrodiacetylgallate is boiled with sodium ethoxide and allowed to stand, the sodium salt of ethyl dinitrogallate was deposited as a bright red, crystalline powder. From the aqueous solution of the latter, hydrochloric acid precipitates ethyl dinitrogallate in the form of small, yellow scales which melt at $153-154^\circ C.$ The same compound was obtained by boiling ethyl dinitrodiacetylgallate with 50 per cent. sulphuric acid. Ethyl monamidogallate hydrochloride, $C_6H(NH_2)(OH)_2.CO_2C_2H_5.HCl.H_2O$, was obtained, together with the diamido-derivative, by the reduction of ethyl dinitrogallate with tin and hydrochloric acid. It forms white needle-shaped crystals, which melt at $210^\circ C.$ with decomposition. It can be precipitated from its aqueous solution by the addition of strong hydrochloric acid. Diazoethylgallate was obtained by the action of nitrous acid on ethyl monamidogallate. When recrystallized from dilute acetic acid it forms fine, reddish-brown needles, which melt with sudden decomposition at $182^\circ C.$ When heated with water in a sealed tube at $220^\circ C.$ for four hours, the nitrogen is completely eliminated, and ethyl gallate is produced. Ethyl diamidogallate hydrochloride, $C_6(NH_2)_2(OH)_2.CO_2C_2H_5.2HCl$, was obtained, together with the above described monamido-derivative, by the reduction of ethyl dinitrogallate. It melts with decomposition at $197^\circ C.$, and is very easily oxidized. It dissolves readily in water, and the solution

almost immediately becomes blue, the color being intensified by the addition of a very little ferric chloride, but destroyed by an excess of that compound.—Pharm. Journ., Dec. 28, 1901, 715; from Proc. Chem. Soc., 17, 242.

Bismuth Sub-Gallate—Preparation and Properties.—The usual method employed for preparing bismuth sub-gallate is that of Fischer, which consists in dissolving bismuth sub-nitrate in diluted acetic acid and precipitation by gallic acid. A more convenient and rapid method, however, is that of P. Thibault, the only objection being the necessity of using bismuth hydroxide, which is not as accessible as the subnitrate, and must usually be specially prepared. The bismuth hydroxide is triturated with water, and an excess of pure crystallized gallic is added, continuing the trituration until the white color of the mixture has changed to green-yellow. It is then allowed to stand 24 hours in the cold, washed thoroughly with water, and dried. So obtained, bismuth subgallate is an opaque yellow powder, having the composition $C_7H_7O_7Bi$, but if the aforesaid mixture is allowed to stand during two weeks, a sub-gallate of the same composition is obtained in a crystalline state. It then has a micaceous appearance and exhibits under the microscope small transparent crystals. Anhydrous bismuth oxide is perfectly useless for the purpose of preparing the sub-gallate. Bismuth sub-gallate forms a colorless solution with diluted sulphuric acid, solution being readily effected without heating if the acid is of 20 per cent. strength, but when of lower strength (10 per cent.), heating is necessary. The same conditions prevail when the compound is dissolved in alkalis. On dissolving it in potassium hydroxide solution, the compound $C_7H_7O_7BiK_{1.2}H_2O$ is produced, and an analogous compound is produced, with soda. From these solutions the original sub-gallate is again precipitated on addition of acids. It is soluble also in solution of alkaline carbonates, carbon dioxide being eliminated, and presumably the same compounds (with potassium and sodium) formed. This property points out clearly that the sub-gallate exercises the function of an acid, for which Thibault proposes the name "bismuthgallic acid."—Pharm. Ztg., Dec. 28, 1901, 1033; from Journ. de Pharm., 1901, No. 11.

ORGANIC BASES.

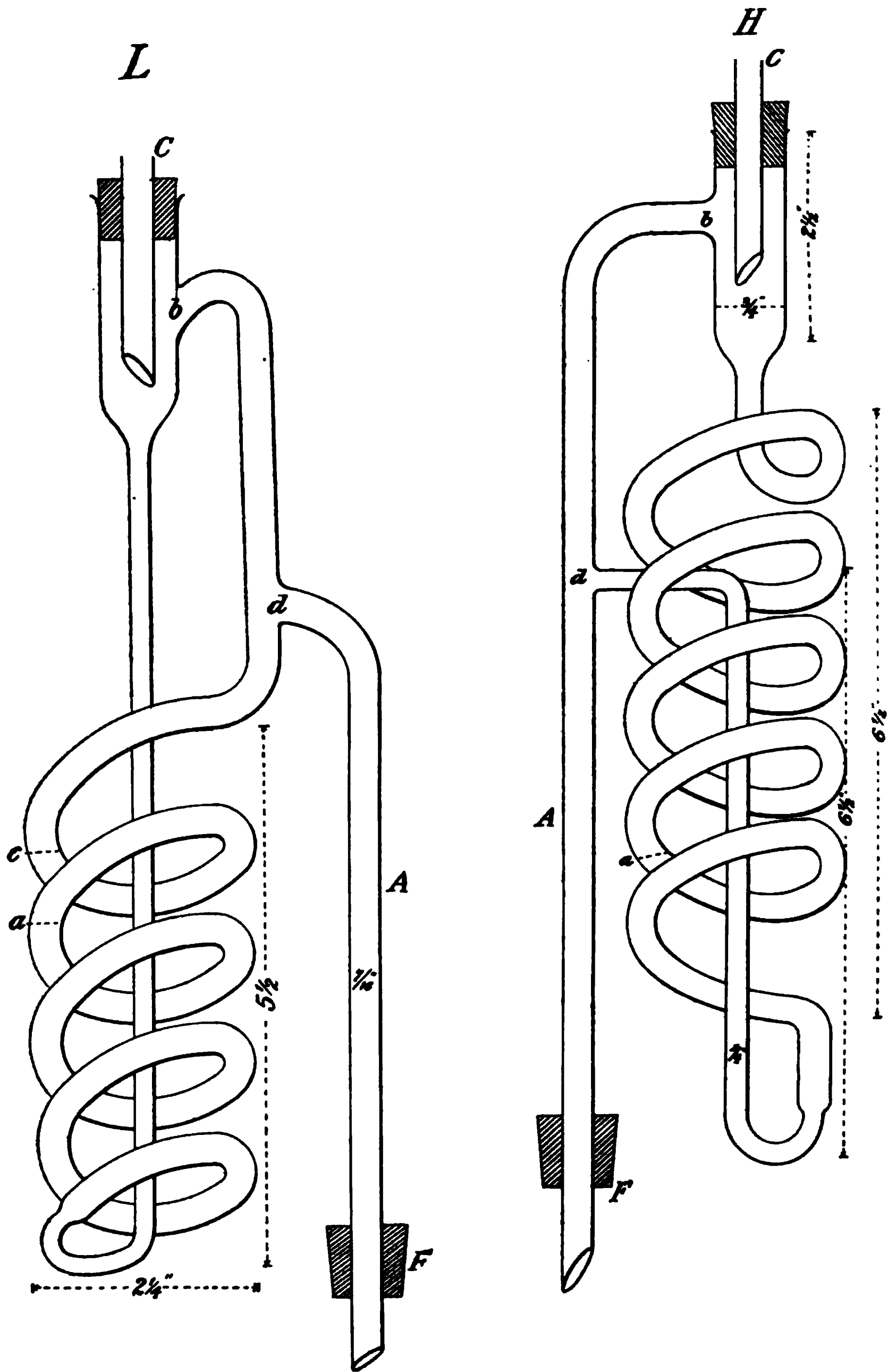
Alkaloids—Resistance to Putrefactive Decomposition.—The experiments of H. Proelis demonstrate that the resistance of alkaloids and other organic proximate principles to putrefactive decomposition is greater than has been supposed—strychnine and cantharidin being the only ones that were hitherto regarded to resist decomposition sufficiently to enable their positive forensic determination after putrefaction had well advanced. He finds that the following organic principles may be identified after the periods named, the number in brackets indicating the periods heretofore observed: Digitalin, 169 days (120); picrotoxin, 161 days (25); colchi-

cine, 258 days (90); brucine, 250 days (100); veratrine, 266 days; strychnine, 250 days; codeine, 254 days; morphine, 260 days. The exception is cocaine, the limit here being 14 days.—Apoth. Ztg., 1901, No. 88; Pharm. Ztg., Dec. 4, 1901, 965.

Alkaloids—Method of Determining their Solubility.—In attempting to dissolve cinchonine in water much difficulty was experienced by Dr. Robert A. Hatcher, owing to the fact that the powder floated upon the surface of the liquid or clung to the sides of the vessel. He eventually resorted to the following method which he considers applicable for determining the solubility of those alkaloids which do not dissolve readily in water: Take 0.1 Gm. of the substance, rub with water to a smooth paste and then with water until a smooth mixture of about 9 Cc. is obtained, to this add enough normal H_2SO_4 from a burette to convert the alkaloid into the sulphate, and then enough water to make 10 Cc. of solution; of this take portions of 1 Cc. each and dilute in several proportions; to each add a slight excess of normal NaOH, and from the relative amounts of precipitate estimate the solubility; again, take several portions of 1 Cc. each and dilute to approximately the point of saturation, in one case using higher and in another lower dilutions; again, precipitate with slight excess of NaOH, and more accurately estimate the solubility. From a third series, using the second estimate as a basis, the solubility may be learned by taking the mean of the highest giving a precipitate and the lowest giving none that is perceptible. A practical application of the method was made by the author in the case of *cinchonine* (which see).—Amer. Journ. Pharm., March, 1902, 134-135.

Alkaloids—Shaking Out Solvents.—H. Proelss finds chloroform to be the best general solvent for shaking out alkaloids from their solutions, but in particular cases he recommends the following: For *colchicine* in acid solutions any of the several solvents will answer; for *digitalin* from acid solution, either chloroform alone or chloroform and alcohol; for *picrotoxin* from acid solution, ether and chloroform, alcohol and chloroform, or benzol; for *brucine* from sodium bicarbonate or ammoniacal solution, ether or chloroform; for *veratrine*, chloroform, ether and chloroform, alcohol and chloroform, or acetic ether from sodium bicarbonate solution, ether or benzol from ammoniacal solution; for *strychnine* from sodium bicarbonate or ammoniacal solution, chloroform, alcohol and chloroform, or benzol; for *atropine* from the same alkaline solutions, chloroform, ether and chloroform, alcohol and chloroform, or benzol; for *codeine*, alcohol and chloroform, benzol, or acetic ether; for *morphine*, acetic ether and alcohol from ammoniacal, alcohol and chloroform from solutions treated with potassium bicarbonate. Emulsification occurs most frequently with benzol, and least with ether and acetic ether. Either sodium bicarbonate or ammonia may be used for liberating brucine, strychnine, atropine and codeine with equal advantage, while ammonia is the better for veratrine,

FIG. 52.



Apparatus for Extraction of Watery Solutions of Alkaloids by Immiscible Volatile Solvents.

and the only good precipitant in this connection for morphine.—Apoth. Ztg., 1901, No. 88; Pharm. Ztg., Dec. 4, 1901, 965.

Alkaloids—Exhaustion of their Watery Solutions by Immiscible Volatile Solvents.—Dr. Torald Sollmann calls attention to and recommends the apparatus shown by Fig. 52, in two forms for the convenient, economical and continuous extraction of watery solutions by immiscible volatile solvents, the form *L* being intended for solvents lighter, the form *H* for solvents heavier than water, and being an adaptation of the Soxhlet apparatus, which is particularly intended to supplant the shaking-out process as ordinarily performed in cases in which large quantities of expensive solvents are required, and lost in manipulation. Both are drawn to a scale, and are largely self-explanatory—the wider tubes having an external diameter of $\frac{7}{16}$ inch, the narrower of $\frac{1}{4}$ inch. When the apparatus is to be used, a 100 Cc. or 250 Cc. flask charged with 30 Cc. or 100 Cc. of the solvent is attached at *F*; 10 Cc. of the solvent are then poured into the expanded funnel tube, followed by the watery liquid which is to be exhausted, amounting to 25 Cc., or less, and not extending beyond the point *a* in the cut. The flask is now set on the water-bath, and the funnel tube is attached at *C* to a reflux condenser, in which the vapor carried from the flask through *A* is condensed and drops back into the funnel.

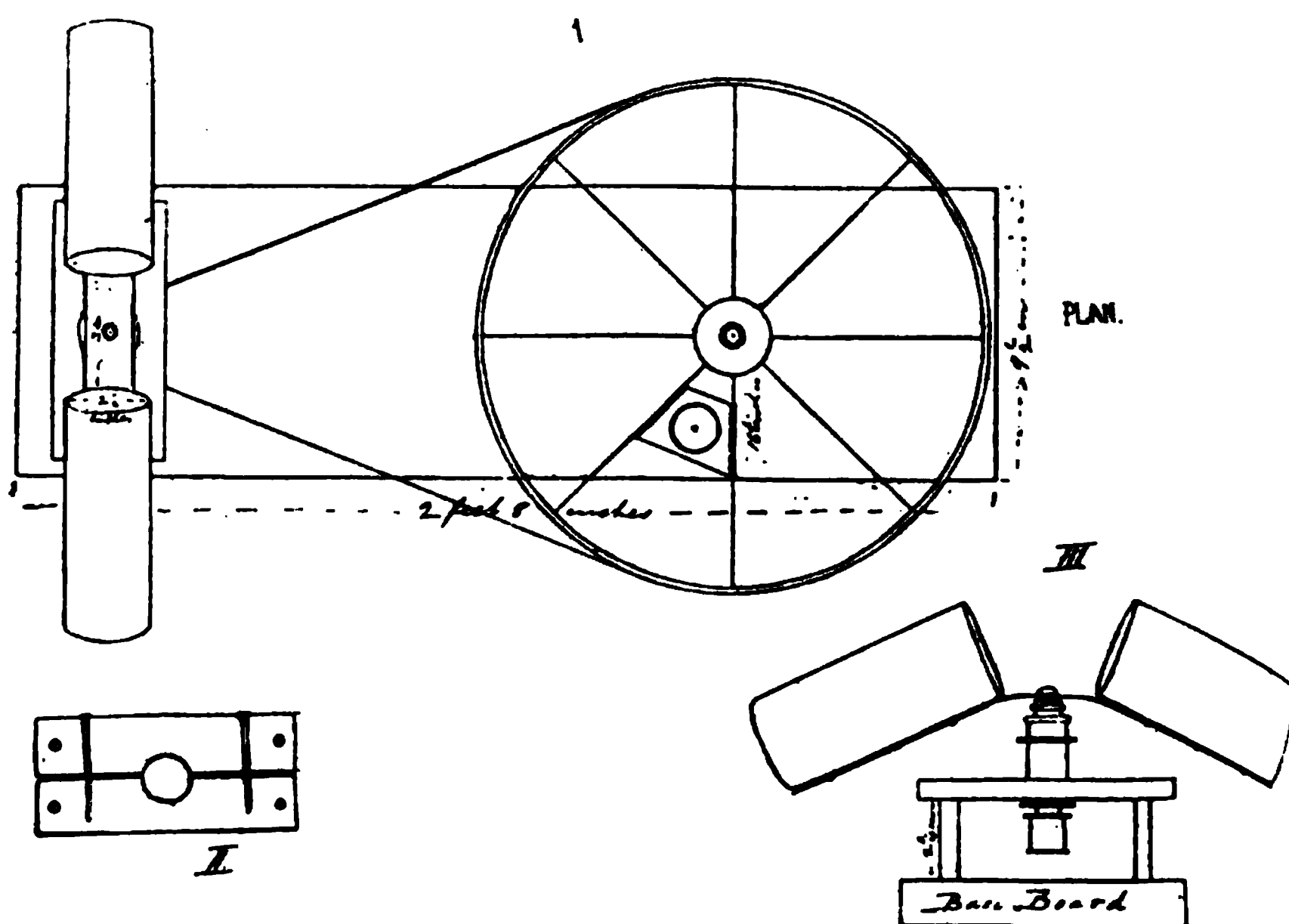
With light solvents, using the apparatus *L*, the solvent displaces the water from the narrow tube, driving it toward *c*. As soon as enough of the solvent has accumulated to extend beyond the bend of the lower end of the tube, it will ascend in bubbles through the solution contained in the coils, and will be discharged through *d* back into the flask, from where it will repeat its circuit. When apparatus *H* is used, for heavy solvents, the solvent descends in bubbles through the solution in the coils, ascends through the narrow tube and flows back into the flask through *d*. In both cases, if the heat is properly regulated, the apparatus will act perfectly automatically, and may be left to itself until the solution is entirely exhausted.—Amer. Journ. Pharm., June 1902, 279–281.

Alkaloids—Advantages of the "Perforation" Method of Extraction over the Shaking-Out Process.—Dr. Edmund Springer communicates the results of experiments undertaken with the object of determining the volatile solvents most advantageously used in the so-called "perforation" method for the extraction of alkaloids from their alkaline solution, as well as the reliability of the method as compared with the "shaking-out" process. With the aid of suitable apparatus, which have been proposed in several more or less perfected forms (see preceding abstract), the extraction of alkaloids by the new method, under judicious selection of the immiscible volatile solvent, proved quantitatively satisfactory. The alkaline precipitants experimented with were sodium hydroxide, carbonate and bicarbonate and ammonia. The immiscible volatile solvents were chloroform, chloroform with 10 per cent. alcohol, ether and benzol; secondarily, iso-

butyl alcohol, amyl alcohol, tetrachloride of carbon, and petroleum ether. The alkaloids subjected to the assay method were: Veratrine, morphine, codeine, strychnine, cocaine, atropine, quinine, narcotine, coniine and nicotine. The results obtained prove chloroform to be the best solvent, the alkaloids mentioned being obtained by its use in quantitative proportions, it being necessary, however, to use chloroform with 10 per cent. of alcohol for the extraction of morphine. In most cases ether or benzol answer quite as well, but the objection to ether is that it dissolves fats and coloring matter in much larger quantities than does chloroform. The principal precaution to be observed is to avoid an excess of fixed alkali in the case of some of the alkaloids under consideration.—Pharm. Ztg., Jan. 29, 1902, 82.

Alkaloidal Assay—Separation of Immiscible Solvents by Centrifugation.

FIG. 53.



Centrifugal Apparatus.

—The troublesome delays caused by emulsification and other causes that interfere with the separation of immiscible solvents is, according to the experience of E. C. Spurge, satisfactorily overcome by the use of a centrifugal apparatus which has been devised by him. The apparatus is shown by Fig. 53; details by Figs. A, B and C. The base-board is of well seasoned wood, 1½ in. thick. The driving wheel is a steering wheel such as was used on old tricycles, having thick spokes, from which the tyre is

removed. A hole is made in the base-board about 9 in. and a hollow is cut in the under surface of the box. Iron washers are placed on both sides of the hole, the nut is passed through and nipped tightly down from the top of the board—the hollow being so deep that the nut may be turned under surface. A handle is attached between two wheels, consisting of a brass fastened vertically through the top plate and soldered to them, and covered with a cotton-wool bung. The bearing for the revolving cases is clamped between two pieces of $\frac{3}{4}$ in. elm (Fig. II), the top board as shown in Fig. III. A disc-adjusting hub and an adjusting one will do. An ordinary-cotton-reel (about 1 in. diameter) is secured to the lower end of the spindle to serve as a fly-wheel, placed at the top end of the spindle, and the cases are mounted on them. The cases for containing the separators are riveted upon a piece of $1\frac{1}{2}$ in. hoop iron. They are lined with stout paper, and have a plug of cotton-wool in the end. The support consists of two Helvetia laces joined by small buckles. The apparatus is light, and a sprinkling of resin is useful to prevent it from slipping. When required for use, the apparatus is clamped to the work-bench, which as shown in the figure are about as large as can be used, will accommodate two Hirschsohn's flasks or two pear-shaped separators. For alkaloidal work, smaller cases than these are readily provided, the cases being easily re-sized or of other sizes substituted. The outlet tube of the separators should be connected to the tap so as to bring the contents as far away from the separator as possible when centrifugating. In practice it has been found that separation can be effected by means of this apparatus within 60 seconds at the speed attained when using small cases, which must be carefully balanced, being 2000 revolutions per minute.—*Pharm. J.* 1902, 451.

Alkaloids of the Papaveraceæ—Characters and Distribution. Schmidt reviews the work that has been done to establish the names and identity of the alkaloids of the papaveraceæ, other than those found in opium, notably the alkaloids *chelidonine*, $C_{20}H_{19}NO_4$, *chelidonic acid*, $C_{21}H_{21}NO_4$, *β -homochelidonine* and *γ -homochelidonine*, $C_{21}H_{23}NO_4$, *chelerythrine*, $C_{20}H_{17}NO_4$, *sanguinarine*, $C_{19}H_{17}NO_5$, *protopine*, $C_{20}H_{19}NO_5$. All of these have been found in *Chelidonium majus* but one or more of them are also found in all of the following genera: *Stylocheilone*, *Sanguinaria canadensis*, *Eschscholtzia californica*, *Glaucium flavum*, *Glaucium cordata*, *Bocconia frutescens*. It is likewise a constituent of *Somniferum*, as well as of certain plants nearly related to it, such as *Fumaria officinalis*.—*Archiv. d. Pharm.*, 239, N

6, and Aug. 18, 1901, 395-437.—See also *Sanguinaria canadensis*, *Eschscholtzia californica*, *Glaucium luteum* and *Chelidonium majus*, under "Materia Medica."

Morphine—Colorometric Quantitative Estimation.—J. Dabney Palmer proposes the following method for the quantitative estimation of morphine by means of color reaction: A weighed quantity of the sample is put into a test-tube, distilled water poured in, and a few drops of ferric-chloride solution added. This gives a pale greenish-blue color. Into another test-tube, same size, is poured a similar quantity of distilled water, and an equal number of drops of ferric-chloride solution. Then weigh off as much morphine as the sample, and add small portions of it at a time, shaking after each addition, until the same shade of greenish-blue is produced as was offered by the sample. Weigh the morphine remaining and deduct it from the original amount taken; the difference is the quantity of morphine in the sample.—Merck's Rep., May, 1902, 191.

Morphine—Characteristic Reaction.—Henry describes the following characteristic reaction of morphine: A small quantity of the substance to be examined is placed into a capsule, a drop of $\frac{N}{20}$ sulphuric acid is added, and the mixture stirred until solution is effected. Some lead peroxide is then added, the mixture stirred during six or eight minutes and allowed to stand three or four minutes longer, during which the peroxide forms a closely adhering precipitate on the walls of the capsule. The clear liquid may then be drained off and an addition of a drop of ammonia affords an immediate brown color if morphine is present, this color being due to the production of proto-catechuic acid at the expense of the alkaloid.—Pharm. Centralh., Dec. 12, 1901, 787; from Chem. Ztg., 1901, Rep., 276.

Morphine—Reliability of Kobert's Formaldehyde-Sulphuric Acid Test.—A recent statement that certain coal-tar derivatives—salicylic acid, resorcin, creosote, carbolic acid give purple color reactions similar to that produced by Kobert's formaldehyde-sulphuric acid test for morphine, has induced Robert A. Hatcher, M. D., to make some comparative tests with these substances and their compounds and with morphine, with results, given in the form of a table, from which he concludes that the test is reliable for morphine. It is well for one to become familiar, however, with the reaction of the substances mentioned under the test, and if these are present to remove by some method, such as agitation with ether after dilution, whereby the morphine is left behind. Free carbolic acid may be dispelled at a temperature below that required to decompose morphine, and, if in alkaline combination, by evaporating for some time with sulphuric acid. The reagent is made by mixing 5 Cc. of formaldehyde (40 per cent.) with 100 Cc. of sulphuric acid. Morphine gives a maroon color, deepening on standing, bleaching on heating to dirty brown. Carbolic acid, a crimson, deepening to garnet on standing. Sodium salicylate, a faint pinkish sal-

mon, but if chemically pure no color whatever, and the same is true of C. P. salicylic acid.—Amer. Journ. Pharm., Jan., 1902, 35.

Lloyd's Reaction for Morphine—Colors Produced with Other Alkaloids.
—Dr. Joseph L. Mayer's experiments with Lloyd's reaction for morphine when applied to other alkaloids show that the colors produced by stirring the alkaloid named with hydrastine and conc. sulphuric acid for five minutes, are as follows:

Aconitine	Brown.
Atropine	Pinkish.
Berberine	Greenish-brown.
Brucine	Light-brown.
Caffeine.....	Dirty-white.
Cinchonine	Dirty-yellow.
Cinchonidine	Dirty-white.
Cocaine.....	Unaffected.
Codeine	Pinkish.
Digitaline	Mahogany.
Heroine	Violet to purple.
Homatropine	Pale-yellow.
Hyoscyamine	Dirty-white.
Morphine	Violet-blue.
Pilocarpine	Light-brown.
Quinidine	Light-green.
Quinine	Greenish-yellow.
Sparteine	Greenish-yellow.
Strychnine	Dirty-white.
Veratrine	Royal purple.

An analysis of these results shows that but three out of the twenty samples examined give a violet-blue color under the above conditions—viz.: Heroine, morphine and veratrine.—Proc. N. Y. State Pharm. Assoc., 1901, 252-254.

Morphine and Atropine—Reciprocal Antagonism.—E. Bashford has studied the action of atropine as an antidote to morphine poisoning, and arrives at the conclusion that it is difficult to say whether morphine and atropine are mutually antagonistic, that is to say whether morphine could save from death a subject poisoned by atropine, or *vice versa*. The author experimented on rats, and found that if the minimum lethal dose (determined by experiment) was hypodermically injected, from $\frac{1}{12000}$ th to $\frac{1}{800}$ th of the minimum fatal dose of sulphate of atropine was effectual in averting death. A larger quantity of atropine was not only useless, but sometimes hastened the death of the animal by adding the toxic effect of atropine to that of morphine. Half the minimum lethal dose of morphine is fatal if combined with one-third the poisonous dose of atropine. If a larger quantity of morphine is administered the effective dose of atropine is greatly limited. The extremely small amount of atropine which can

with safety be given in case of morphine poisoning is the most important fact which observers have established.—Pharm. Journ., Feb. 15, 1902, 121; from Nouv. Rem., 23, 536, after Archiv. Internat. de Pharm. et de Thérap.

Codeine Phosphate—Correction of the Potassium Hydrate Test of the Pharm. Germ., IV.—Th. Ludwig criticises the test of the Ph. Germ., IV, which depends on the formation of a precipitate on addition of potassium hydrate solution to a solution of codeine phosphate. The author finds that under the conditions of the test, a turbidity is produced but disappears again almost immediately on shaking. If, however, the clear solution is then allowed to stand for 24 hours, a crystalline deposit forms; or this crystalline deposit may form within 1 to 5 minutes if the mixture is vigorously shaken.—Pharm. Ztg., May 28, 1902, 420.

Narcotine—Advantages of Its Presence in the Galenical Preparations of Opium.—See *Deodorized Liquid and Tincture of Opium*, under "Pharmacy."

Per-Bromides of the Cinchona Alkaloids—Formation and Characters.—A. Christensen has prepared and examined the perbromides of quinine, cinchonidine, cinchonine, and quinidine, all of which, except the last-named, form crystalline compounds, which have similar formulæ, of which *quinine-di-bromide bromhydrate perbromide*, $C_{20}H_{24}O_2N_2Br_2 \cdot 2HBr \cdot Br_2$, may be taken as the type. This is obtained by treating the alkaloid with two molecular weights of hydrobromic acid, and then, at 60° C., with bromine, when the new compound separates out as an orange-red powder of micro-rhombic pyramids and prisms. From this, two new compounds, $C_{20}H_{22}O_2N_2Br_2$ and $C_{20}H_{24}O_2N_2Br_2$, have been obtained. The cinchonidine salt, $C_{19}H_{22}ONBr_2 \cdot 2HBr \cdot Br_2$, forms thin bright yellow crystalline scales, which, like the quinine compound, gives cinchonidine dibromide, $C_{19}H_{22}ON_2Br_2$, on reduction with sulphurous acid and precipitation with ammonia, which is identical with Skalweit's di-bromo-cinchonidine. It forms a crystalline hydrochloride bromide, sulphate and nitrate. The cinchonine perbromide occurs as yellow or reddish-yellow hard warty rhombic crystals.—Pharm. Journ., Sept. 7, 1901, 313; from Chem. Centralblatt, 72, 1377.

Quinine Saccharinate—Preparation and Characters.—H. Désfournel finds that when a solution of two molecules of saccharin in ethyl alcohol is mixed with a warm (alcoholic? Rep.) solution of one molecule of quinine and the mixture is evaporated to dryness, a syrupy uncrystallizable body, slightly soluble in cold water, fairly so in hot water, and easily soluble in alcohol, ether, and chloroform results. This body is the neutral saccharinate of quinine. The basic saccharinate of quinine is obtained by evaporating on the water-bath a mixture of an alcoholic solution of one molecule of anhydrous quinine with an alcoholic solution of one molecule of saccharin; as in the former case, a syrupy non-crystallizable mass is

obtained. The basic saccharinate of quinine can, however, be obtained in the crystalline form by following the general method for the preparation of the metallic saccharinates, which consists in effecting the double decomposition of saccharinate of soda and the metallic sulphates in aqueous alcohol, only the metallic sulphate is replaced by sulphate of quinine.—Chem. News, Nov. 8, 1901, 232; from Bull. Soc. Chim., 25, No. 11.

Euquinine (Chininum Aethylo-Carbonicum)—*Characterization*.—The Swiss Pharmacopœia Commission characterizes euquinine as follows: White, felty, odorless and tasteless needles having a neutral reaction. Sparingly soluble in water, readily soluble in alcohol, ether, chloroform, benzol and diluted acids. Melting point 92° C. The solution in very dilute sulphuric acid exhibits a blue fluorescence. If to a few cubic centimeters of this solution a few cubic centimeters of fresh chlorine water, followed by an excess of ammonia, are added, a green coloration results. It should be dissolved by conc. sulphuric acid with a faint yellow color; its solution in diluted nitric acid should evidence no change on addition of barium chloride, nor silver nitrate. On platinum foil it should burn without leaving a residue.—Pharm. Ztg., Mar. 19, 1902, 220.

Cinchonine—Solubility in Water.—Robert A. Hatcher, M. D., having occasion to examine a specimen of cinchonine from a reputable manufacturer, which was sold as pure, found it to conform to every pharmacopœial requirement, except that of solubility in water. The U. S. P. states that cinchonine is soluble in 3760 parts of water, which corresponds essentially with the solubility determined by Hesse (3770 at 20°) as quoted by Roscoe and Schorlemmer. Applying the method for determining the solubility of alkaloids proposed by himself (which see under "Alkaloids"), the author found cinchonine to be far less soluble than given by these authorities, viz., 1 : 23,000, approximately.—Amer. Journ. Pharm., March, 1902, 136.

New Cinchonine Salts—Sulphocarbolate, Sulphocreosotate and Acid Hydrochloride.—G. Tarozzi has prepared three salts of cinchonine which have not hitherto been described, the sulphocarbolate, sulphocreosotate, and acid hydrochloride, all of which are obtained by double decomposition between cinchonine bisulphate and the barium salt of the required acid.

Cinchonine Sulphocarbolate forms transparent reddish-white plates, is soluble in distilled water, and gives an immediate blue color with ferric chloride.

Cinchonine Sulpho-creosotate is uncrystallizable, soluble in 10 parts of water, has a bitter, somewhat smoky taste, and produces a transient violet color with ferric chloride.

Acid Cinchonine Hydrochloride crystallizes in transparent prismatic needles, but may also be obtained in an amorphous condition. The con-

centrated solution has a faint acid reaction. The salt is easily soluble in ordinary alcohol and has a bitter salty taste. These several salts of cinchonine are recommended as superior to free cinchonine as antiseptics and antipyretics.—Pharm. Ztg., Aug. 3, 1901, 618; from Bull. Chim. Pharm., 1901, 378.

Emetine Hydrochloride—Pharmacological Properties.—Maurel has investigated the pharmacological properties of pure emetine hydrochloride and its toxic action on cold and warm blooded animals. He finds that the smallest lethal dose per kilogram of animal amounts to 0.15 Gm. in the case of the conger eel, pigeon and rabbit. Emetine acts as a local anæsthetic in the case of the rabbit. In practical medicine it is noteworthy that emetine induces vascular constriction and raises the normal circulation. This stimulation takes place even when the circulation is retarded by artificial means; it is even possible to revive the circulation with the aid of pure emetine hydrochloride after artificially inducing its complete stasis.—Pharm. Journ., May 10, 1902; from Merck's Bericht, 1901, p. 75.

Strychnine—Diminution of Toxicity by Colloidal Substances.—Dr. Robert A. Hatcher, in the course of investigations now in progress and undertaken with a view to leaning by life-tests whether strychnine is destroyed in the tissues or not, and what influence certain conditions may have upon this destruction, has made some observations concerning the influence of certain colloidal substances, such as gum, mucilage and oils, upon the toxicity of strychnine. Experimenting upon frogs and guinea pigs he found that by the use of the one or the other of these colloids in preparing the hypodermic strychnine solutions, doses which would kill promptly were materially modified, death being delayed or even prevented altogether according to the quantity or quality of the colloid employed. From his results it follows that the presence of colloidal substances diminishes or retards the toxicity of alkaloidal poisons injected hypodermically, as they do when given by the mouth—the latter having already been pointed out by Schmiedeberg and others.—Amer. Journ. Pharm., June, 1902, 283–285.

Strychnine—Color Reaction with Permanganate and Sulphuric Acid.—In his work on "Reactions," F. A. Flückiger has adopted a solution of permanganate in sulphuric acid as a color reagent for strychnine. Flückiger's reagent consisting of 0.02 Gm. KMnO_4 , 10 Cc. water and 30 Cc. conc. sulphuric acid, and producing a violet color. The Pharm. Germ. states that a solution of

Strychnine Nitrate in sulphuric acid, when triturated with a small granule of potassium dichromate or permanganate, acquires a blue-violet color. According to Henrick Enell this statement is incorrect in so far as the reaction with potassium dichromate is concerned, the presence of *nitric acid* preventing the reaction with chromic acid almost completely,

but that with permanganate the reaction occurs. The addition of more nitric acid here also impairs the reaction. He observes that it is important that the permanganate be applied as directed by Flückiger, which the official method is for there are a large number of substances that produce a color with potassium permanganate and sulphuric acid differing from those of Flückiger's test. With Flückiger's test a very faint violet coloration, which does not appear until well developed, often requiring several minutes, and no potassium has been added in large excess. Using a much stronger solution of potassium permanganate in sulphuric acid (1 : 500), he gives the following results: 5 to 10 Mgm. of the substance is dissolved or triturated with 2 Cc. of sulphuric acid, and sufficient potassium permanganate is added by drops under continual stirring until a violet color is developed with the following results: With vegetable powders, cellulose, manna, sugars, starch, pancreatin, albumen, gelatin, citric-, and hippuric acid, and with glycerin, the reaction is slow, but the color disappeared rapidly. With atropine, emetine, brucine, hyoscyamine, apomorphine, cocaine, heroine, caffeine, and filicic acid, the violet color is developed very gradually; while a large number of synthetic substances, such as acetanilid, antipyrine, salicylic acid, resorcin, &c., &c., give only under the influence of a large quantity of reagent a preliminary color reaction in other shades, such as yellow, green, &c.—Pharm. Ztg., March 29, 1902, 248.

Strychnine and Brucine—New and Simple Method. B. Lyons describes a new simple method for separating brucine from each other, which, while admitting of variations, rests in principle on a sound foundation. When a mixture of brucine and strychnine is treated with diluted (10 per cent) sulphuric acid, a limited quantity, the brucine goes readily into solution, while the soluble part of the strychnine remains undissolved, being converted into sulphate. When pure strychnine is treated in the same manner it takes up only about one milligram of the alkaloid per cubic centimeter. If brucine is also present, a larger quantity is dissolved. In either case, a portion of the strychnine which is dissolved when in a nascent state is deposited afterwards when the alkaloids are associated together the amount of strychnine in solution, as determined by a number of experiments, is about 1 milligram per each Cc. of acid used as solvent; but this factor varies with the temperature. Omitting the details, the assay carried out by stirring 10 milligrams of the mixed alkaloids with 10 per cent. sulphuric acid at room temperature, using 1 Cc. of the dilute acid for

the alkaloids ; the stirring is continued for at least one hour at intervals, the undissolved sulphate collected on a small (2 Cm.) filter, washed with 1 Cc. of dilute acid, the filter and contents are transferred to a beaker, stirred with 3 Cc. of 10 per cent. ammonia and 10 Cc. of chloroform, transferred to a separator, and shaken out with the chloroform, followed by two successive portions each of 5 Cc. The chloroformic solution is dried in a tared beaker to constant weight, having first added 2 Cc. alcohol when nearly dry, and the ascertained weight is corrected by adding 1.75 milligrams for every Cc. of dilute acid used. This correction may, however, be avoided if a duplicate experiment be made, using the acid from the first experiment for the treatment of an equal quantity of the same alkaloidal mixture. But the proportion of acid must be increased in the first experiment to 1 Cc. for each 10 milligrams, while the duplicate experiment must be carried out exactly in the same manner as the first. Or, instead of a duplicate assay, the acid employed might be saturated with strychnine under the conditions of the test. Such a solution can be made by shaking 225 milligrams of strychnine, 275 milligrams of brucine, and 100 Cc. of diluted sulphuric acid together at intervals during an hour, then filtering.—Pharm. Rev., June, 1902, 253-255.

Eserine Sulphate—Proposed Dilution with Boric Acid.—Discussing the difficulties encountered in dispensing eserine sulphate, on account of its hygroscopic properties, Garret V. Dillenback suggests that it be diluted with boric acid, in fine powder, so that 1 grain of the dilution shall represent $\frac{1}{10}$ grain of the eserine salt. This dilution enables the more accurate weighing of fractional grains of the medicament, and keeps it in a permanently convenient condition. Indeed, it is thought by the author, that the addition of boric acid may be a physiological advantage.—Merck's Rep., May, 1902, 189.

Aconitine—Estimation in Galenical Preparation.—H. Ecalle recommends the following method for determining the aconitine by which the alkaloid is finally precipitated as silico-fluoride, and the amount calculated from the quantity of silica and tungstic oxide obtained on incineration. A known weight of tincture or fluid extract, say 125 Gm., is evaporated on the water-bath until the alcohol is dissipated, and, when cold, acidified with 10 Cc. of $\frac{N}{10}$ HNO_3 . The mixture is then introduced into a separator and treated with 100 Cc. of ether and 4 Cc. of ammonia. After separation, the alkaline liquor is shaken out with successive quantities of ether until no alkaloidal reaction is obtained with a drop of the ether washings with Mayer's reagent. The ethereal extract is then shaken out first with 7 Cc. of 10 per cent. HNO_3 , and then with water, until all the alkaloid is removed. The bulked watery solutions are then warmed to drive off the ether, cooled, acidulated with 12 to 15 Cc. of 10 per cent. HNO_3 , and the alkaloid precipitated with an excess of 7 or 8 Cc. of a 5 per cent. solution of silico-tungstic acid. The mixture is heated on the naked flame until

boiling commences. It is then set aside for twenty minutes for the precipitate to subside. The precipitate is then collected, washed with water, dried, and finally incinerated in a crucible. The weight of the residue $\times 0.793$ gives the amount of the preparation taken. It is not a simple alkaloidal compound contains only true "aconitine." (Aug. 24, 1901, 273; from Journ. Pharm. Chim. (

Pseudaconitine and Japaconitine.—Comparison with that of Aconitine.—In a recent paper presented to the Royal Society of Great Britain (June 20, 1901), Professors Cash and Harnack give the results of experiments made to compare the physically prepared *pseudaconitine* (from *Aconitum ferox* or *Aconitum Fischeri*, or *Japanese aconite*), with that of *aconitine*. The differences found are nearly always differences of degree, and not of kind, a result which bears out the constitutional similarity which may be inferred from their chemical reactions. The relative toxicity of *pseudaconitine* to *aconitine* is found to be approximately as that of the small mammals and birds which were used. *Pseudaconitine* has been seldom contrasted with the other two aconitines, but is recognized as stronger than *aconitine* by Langaar's experiments and observations by Harnack and Mennicke. Kobert, however, does not separate *japaconitine* from *aconitine* and *pseudaconitine*. Based upon the observations made, the relative toxicity for medicinal purposes, would be approximately, regarding that for *aconitine* as 1, for *pseudaconitine* 0.4 to 0.45, and for *japaconitine* 0.3. The local action of the aconitines upon sensory (cutaneous) nerves is such that the differences are so trifling as to be negligible. For medicinal employment of *aconitine*, *japaconitine*, and *pseudaconitine*, the great similarity in their physiological actions, amounting to a relative identity which is established by this investigation, would permit the employment of any one for internal administration, provided it is properly regulated. Given in the just proportions the three alkaloids would exert the same action. The authors recommend the use of a pure alkaloidal salt in preference to the crude extract from the plants, since the latter would be difficult to standardize. If this were done the action of the *aconitine* would be more uniform, or less extent by the other alkaloids present in the extract. For local applications the three alkaloids may be introduced in identical proportions.—Chem. and Drugg., July 2, 1901.

Atropine—Synthesis.—The recent investigations of Willstätter have proved conclusively that tropine, required for the synthesis of *atropine*, can be produced by the direct action of hydrobromic acid on *tropine*. In the meantime Willstätter has succeeded in pro-

synthetically, and a complete synthetic chain has thus been established, which may be given as follows: (1) Synthesis of glycerin; (2) from glycerin: glutaric acid; (3) from glutaric acid: suberone; (4) from suberone: tropidine; (5) from tropidine: tropine; (6) synthesis of tropic acid; (7) from tropine and tropic acid: *Atropine*.—Pharm. Ztg., May 7, 1902, 355; from Ber. d. D. Chem. Ges., 1902, 35, No. 5.

Atropine—Micro-Chemical Reaction.—N. Schoorl has devised a micro-chemical method of recognizing atropine which is based upon the characteristic crystallinity of the hydriodides of the tropines. The splitting up of atropine into tropine and tropic acid is simply and easily effected by placing a little of the alkaloid or one of its salts on a glass slide, moistening it with a drop of 30 per cent. sodium hydrate solution, and heating. The alkaloid forms an oily drop, which is stirred with the aid of a platinum wire so as to thoroughly mix it with the lye. The heat being then carefully continued the vapors evolved are condensed on a second cold slide, in several places preferably. A small drop of HCl is then stirred on tropine-spot with the platinum wire, dried, and after moistening with a little water, a little KI is added, which soon converts the hydrochloride of tropine into characteristic, sharply defined needles or rhombs of hydriodide.—Pharm. Ztg., Aug. 3, 1901, 618; from Nederl. Tijdschr. u. Pharm., 1901, 208.

Atropine Sulphate—Remarkable Variation of the Melting Point of the Pure Salt.—The requirement of the Germ. Pharm., IV, that atropine sulphate intended for medicinal use shall be prepared from atropine melting at 115.5°C ., and shall itself have a melting point of 180°C ., is made for the purpose of excluding hyoscyamine sulphate. In a personal communication to Prof. E. Schmidt, E. Merck calls attention to the impracticability of this requirement. He finds that absolutely pure and optically inactive atropine melted at 112° – 113° ; the platinum double salt prepared from this melted at 134° – 136° , and the sulphate, prepared by crystallization from suitable solvents, had a melting point from 185° to 187° under normal conditions of heating; but, being a melting point attended by decomposition, this sank when slow heating was resorted to as low as 182° – 183° , while when the heating was more rapid it rose to 188° – 189°C . Furthermore, it is considered impracticable to produce on a technical scale atropine that is completely free from hyoscyamine, and he therefore questions the propriety of demanding as low a melting point as “near 180°C .” J. Gadamer, in view of the above representation of Merck, has now investigated the subject. Using absolutely pure and optically inactive atropine obtained by a method described, he prepared the sulphate from this by a method also explained. He found the atropine sulphate, when rendered completely anhydrous, and heated slowly in Roth’s apparatus, to melt at 183° – 184.5° ; but when the identical preparation was immediately afterwards transferred to capillaries and heated in the sulphuric acid bath

as directed in the Germ. Pharm., IV, it melted at 156° – 160° . Then, if again completely dried over sulphuric acid, and subjected to the official test, it melted at 187° – 188° , after which it melts at 160° – 161° if immediately tested in Roth's apparatus. These results confirm on the other hand Merck's observations, and on the other point out that even the smallest quantity of moisture has the effect of reducing the melting point over 20° , and that consequently the determination of the melting point cannot be relied on as a criterion of the purity of atropine sulphate. The simplest test would doubtless be that of polarization; but this method can be applied only in exceptional cases in ordinary pharmacies. Dr. Gadamer has, however, in a previous paper pointed out the way in which the preparation of a completely inactive atropine, and consequently free from hyoscyamine, can be prepared industrially and with very little additional cost.—Arch. d. Phar., 239, No. 5 (July 6, 1901) 333–336.

Solanine—Alleged Occurrence in Tobacco Seeds.—In a paper, recently published in Palermo (1900), G. Albo announced the probable occurrence of solanine in tobacco seeds, basing his assumption on a micro-chemical examination. Having convinced himself of the reliability of the micro-chemical method described in Beilstein's Handbuch (Vol. III, p. 62), J. Starke has subjected the seeds of Grammont tobacco and of *Nicotiana macrophylla* to careful examination, and determined the *absence* of solanine in both of these seeds. Furthermore, in order to ascertain whether or not another, hitherto unknown alkaloid is present in these seeds, the author examined them by Stas' method, but found only nicotine. As is admitted by other experimenters, including Albo, however, the nicotine is not a constituent of the seeds themselves, but is derived from fragments of the tobacco which adhere to them.—Pharm. Ztg., Nov. 6, 1901, 889; from Bull. Acad. roy. Belgique, 1901, 379–383.

Pilocarpine—Investigations Concerning its Chemical Relations.—In previous papers Pinner, in conjunction with Kohlhammer, had shown that when pilocarpine was oxidized with permanganate under certain conditions a dibasic acid was formed, having the formula $C_8H_{12}O_5$, which was named piluvic acid. On the other hand, Jowett showed that when isopilocarpine was oxidized with permanganate under slightly different conditions from those employed by Pinner, two lactic acids were formed, having the formulæ $C_7H_{10}O_4$ and $C_8H_{12}O_4$. The author, in conjunction with R. Schwarz, has now repeated the experiments of Pinner and Kohlhammer, as well as those of Jowett, with confirmatory results. By the oxidation of pilocarpine they obtained, in addition to oxalic acid, an acid yielding a crystalline amide, which does not appear to have been obtained in the pure condition, as a product melting at 164° C., and which on analysis gave results differing 1.5 per cent. from theory of the carbon-determination, and on further recrystallization melted at 182° C.; but it is not stated whether this last melting point remained constant on further

recrystallization. By the oxidation of isopilocarpine, homopilopic acid was obtained, as the amide melted at almost precisely the point previously given by Jowett (found 206° C., Jowett's m. p. 208° C.) For the acid obtained by the oxidation of pilocarpine they now propose the formula $C_8H_{14}O_5$, and the name homopilomalic acid. An acid obtained by Pinner and Kohlhammer by the oxidation of the product formed by the action of chromic acid on pilocarpine has been further examined. It was previously named isohydrochelidonic acid, $C_7H_{10}O_5$, but they now propose the formula $C_7H_{12}O_5$, and call it pilomalic acid. This acid does not yield the lactonic acid $C_7H_{10}O_4$ (Jowett's pilopic acid) on heating. The new formula assigned to these two acids is therefore that of the hydroxydibasic acids derived from the lactonic acids pilopic and homopilopic acids. The properties of isopilocarpine previously described by Petit and Polonowski, and by Jowett, are confirmed, and crystalline compounds of both pilocarpine and isopilocarpine with mercuric chloride are described. The hydroxy acid corresponding to isopilocarpine—viz., isopilocarpic acid—has been examined, and the acid character of isopilocarpine confirmed.—Chem. & Drugg., March 22, 1902, 457; from Ber. d. D. Chem. Ges.

Pilocarpine—New Identity Reaction.—H. Helch suggests a method for the identification of pilocarpine which is based upon the observation that the well-known reaction of chromic acid, hydrogen dioxide and ether, resulting in a characteristic blue color, does not occur when chloroform or benzol are substituted for the ether, but that if pilocarpine is present, the reaction takes place equally well in the presence of these liquids. The reaction is carried out as follows: About 0.01 to 0.02 Gm. of pilocarpine hydrochloride is dissolved in a little water, 1 or 2 Cc. of acid hydrogen dioxide is added and a layer of about 2 Cc. of benzol is added, followed by a few drops of very dilute solution of potassium bichromate (0.003 Gm. in 1 Cc.). The mixture is then carefully shaken, and allowed to separate by standing, when the benzol will show a distinct violet color (in the presence of larger quantities of pilocarpine, blue). The reaction is quite delicate, and under the conditions named, may be regarded as characteristic for pilocarpine, pyridine being the only one of a large number of bases and synthetic compounds that gives the same reaction.—Pharm. Ztg., June 7, 1902, 446; from Pharm. Post, 1902, No. 20.

Pilocarpine—Mydriatic Effect of its Solution Due to Alkaloidal Products of Decomposition.—Lilienfeld has made an experimental inquiry into the causes that determine the unwelcome mydriatic effect of old pilocarpine solutions which are not infrequently observed when the medicament is applied in the treatment of glaucoma. This untoward effect has heretofore been attributed to the presence of jaborine and the present experiments, which were undertaken with pilocarpine of established purity, with pure jaborine and with mixture of the two, confirm this view. But it has recently been demonstrated that jaborine is not a single body; that it is

a mixture of a little pilocarpine with its decomposition products—isopilocarpine, pilocarpidine and isopilocarpidine. This led the author to extend his inquiry so that the identity of the body is actually responsible for the mydriatic effect of old pilocarpine solutions might be established. The results of his studies point out that this is due to isopilocarpine and possibly also to isopilocarpidine. He furthermore finds that the tests of the Pharm. Germ. do not afford a guarantee of sufficient purity and of the suitability of pilocarpine hydrochloride for the treatment of cases, such as glaucoma, in which the production of mydriasis is to be avoided. While fully recognizing the difficulties attending the production of a pilocarpine preparation that is completely free from these decomposition products, the author considers it imperative that the oculist should demand a product of such purity. Solutions of the pure pilocarpine preparation should not be prepared in quantities larger than may be consumed within two or three weeks. In its pure crystalline condition pilocarpine hydrochloride will keep unchanged for months.—Pharm. Ztg., July 31, 1901, 607.

Cocaine—Determination in Presence of Other Coca Bases.—W. Garsed and J. Norman Collie have made an extensive series of experiments with the object of devising a method for the determination of cocaine in the presence of other coca bases. These experiments cover: first, the reactions of pure cocaine—its behavior towards various reagents, solvents, etc.; second, whether any of these reactions are such as to admit of quantitative application, and third, the behavior of other coca bases towards these reagents. The result of these studies appears to show that *pure* cocaine and its salts may readily and accurately be determined quantitatively by titrating its solutions with iodine, but that in the presence of the other coca alkaloids, ecgonine, benzoyl-ecgonine, cinnamyl-cocaine and isatropyl-cocaine—these are also precipitated by the iodine and to the extent of their presence vitiate the quantitative result. The experiments have further shown, however, that if ecgonine and benzoyl ecgonine are present, these may be removed by taking advantage of their insolubility in ether or petroleum ether, whilst cocaine is quantitatively extracted by these solvents from alkaline aqueous media. Furthermore, cinnamyl-cocaine if present in the cocaine is completely destroyed by the action of $\frac{N}{10}$ permanganate solution, while the cocaine is not affected, but comes out after treatment perfectly white. On the other hand, isatropyl-cocaine requires a much stronger solution of permanganate for its destruction, and the employment of such a strong solution would result in the partial destruction of the cocaine.—Pharm. Journ., Aug. 10 and 17, 1901, 222–227 and 254–258.

Cocaine—Difficulty of its Forensic Determination.—In the course of his investigations concerning the resistance of alkaloids and other poisonous proximate principles to the influence of putrefaction (see “Alkaloids”), H. Proelss has obtained results which confirm the experience noted by others that the detection of cocaine is almost impossible so soon as its

decomposition into ecgonine has taken place. He was, moreover, unable to decide upon a really characteristic reaction either for cocaine or for ecgonine. The special experiments made with ecgonine for this purpose, revealed that this body is not removable from its solutions, either when acid, alkaline or ammoniacal, by any of the shaking-out solvents that are commonly or more specifically employed. Neither was he successful in separating this base from dry material, such as sea-weed or gypsum, by these solvents, nor by precipitation with isopotassium iodide or phosphomolybdic acid and decomposition of the precipitates with silver oxide or barium oxide. In short, the author concludes that cocaine can at present not be identified in cadavers or other putrescent organic substances so soon as its decomposition has been carried on sufficiently to convert it into ecgonine.—Pharm. Ztg., Dec. 4, 1901, 965.

Ecgonine—Addition Products.—Dr. O. Hesse has now for the first time published the results obtained some ten years ago during his studies of ecgonine and its addition products. He found that when ecgonine is boiled with an excess of methyl iodide for two hours, with the aid of a reflux condenser, the addition product of ecgonine and methyl iodide is formed very readily, and on concentrating the solution an almost colorless mass separates, which crystallizes from alcohol or water in colorless prisms. It has the formula $C_9H_{15}NO_3, CH_3I + H_2O$. The methyl chloride compound $C_9H_{15}NO_3, CH_3Cl + H_2O$ can be obtained from the iodide by digestion with silver chloride. It is readily soluble in water, but less so in alcohol. The base is not precipitated by soda solution, which distinguishes it from ecgonine methyl ester hydrochloride obtained by Einhorn and Klein. The gold and platinum salts have been prepared. The hydroxide $C_9H_{15}NO_3, CH_3OH + H_2O$, obtained by treating the chloride or iodide with silver oxide, crystallizes in fine colorless prisms which readily dissolve in cold water with a neutral reaction. With benzoyl chloride it forms benzoyl ecgonine methyl chloride, which is readily soluble in water, but is not precipitated by soda solution, although saponified by it on boiling, when the benzoic acid can be detected in the usual manner. Ethyl iodide also combines with ecgonine, but less readily, forming $C_9H_{15}NO_3, C_2H_5I - 2H_2O$. It crystallizes from alcohol in fine colorless prisms which very readily dissolve in water, but less so in alcohol. Ecgonine ethyl hydroxide, $C_9H_{15}NO_3, C_2H_5OH + H_2O$, obtained by digesting the iodide with silver oxide, crystallizes from water in long colorless prisms. Ether removes nothing from the aqueous solution of the iodide when treated with soda, showing that the alkyl is combined in a similar manner to that in the methyl compound.—Pharm. Journ., April 5, 1902, 275; from Jour. f. pratet Chem., 65, 91.

α - and β -Eucaïne—Identification and Properties.—Charles L. Parsons read an interesting paper on α - and β -eucaïne at the Denver meeting of the American Chemical Society (August, 1901), which is mainly devoted

non-eucaine and non-cocaine, for which they are recommended as substitutes in local anesthesia. The reactions of the hydrochlorides of the three bodies are alike with the following reagents: Mayer's, Wagner's, tannic acid, picric acid, iodine, Fröhde's, mercuric chloride, ferric chloride and potassium ferricyanide, cadmium iodide, etc. Reactions that are characteristic of

α -Eucaine: Potassium iodide (1:10) gives, even in moderately dilute solutions of the hydrochloride, a white silky and glistening precipitate. Ammonia, even in dilute solutions, precipitates the α -eucaine, this base being almost insoluble in excess, while both β -eucaine and cocaine are almost immediately redissolved. Potassium dichromate in strong solution, added drop by drop to a 0.5 per cent. solution of α -eucaine, begins to throw down a fine lemon-yellow precipitate after addition of one or two drops—the precipitate being very much increased by one or two drops of strong hydrochloric acid and becoming quite insoluble. A 1 per cent. cocaine solution affords no precipitate until the hydrochloric acid has been added, and this precipitate is easily redissolved in slight excess of the acid, and β -eucaine acts similarly to cocaine. The chief characteristic property of

β -Eucaine Hydrochloride, by which it is readily distinguished from cocaine hydrochloride, is its comparative insolubility in water and alcohol. No chemical reactions of positive character have been found characteristic of β eucaine, which can consequently be distinguished only negatively by failure to respond to the reactions characteristic of *α -eucaine* and of

Cocaine, the latter being distinguished from either of the eucaines by the following reaction: the greyish black color produced when a small amount of the hydrochloride is rubbed with dry calomel and then moistened with alcohol (*α -eucaine* became dark-grey; *β -eucaine* is not affected); the yellow crystalline precipitate, insoluble in hydrobromic acid produced by platinic chloride in 1 per cent. solution of hydrochloride (*α* and *β -eucaine*, in 1 per cent., are not altered); the greater stability of the permanganate of cocaine than of the permanganate of most other alkalis. The addition of solution of permanganate to solution of hydrochloride of these bases effects an immediate change to brown in the case of *eucaine*, while with cocaine the original color holds for at least half an hour. The author also points out numerous microscopic characters that may prove of value in the identification of the bases named.—*Journ. Pharm.*, April and May, 1902, 194–200, and 236–237; *from Amer. Chem. Soc.*, 1901, 885.

Berberine—Occurrence and Detection in Plants.—H. M. C. describes the method for testing a drug for the presence of berberine. He considers to be absolutely reliable for establishing either its presence or absence. It is carried out as follows: Exhaust from 10 to 2

powdered drug with hot alcohol in a Soxhlet or any other suitable apparatus, distill the alcohol off completely, adding water at the end of the distillation, and make up the aqueous liquid to about 20 or 40 Cc. Filter, using a little talcum if necessary, and to the clear filtrate apply the following tests:

1. To 2 or 3 Cc. of the filtrate add a few drops of a 20 per cent. solution of potassium iodide. If no precipitate occurs there is no berberine in the drug. If potassium iodide produces a precipitate then apply test No. 2.

2. To 10 Cc. of the clear filtrate add 1 to 2 Cc. of 10 per cent. sodium hydrate (which precipitates most other alkaloids if such are present); filter, if the alkali produces a precipitate, warm the solution to about 50° C., add 5 Cc. of acetone and set aside three or four hours. If, at the end of this time, no crystals of berberine-acetone appear, add 30 Cc. of water to the liquid and set it aside two or three hours longer. In the presence of not less than 0.01 gram of berberine in the 10 Cc. taken there will be a considerable amount of beautiful shining crystals of a silky luster floating in the liquid. These crystals of berberine-acetone are collected on a small filter and thoroughly washed with water until the latter comes out colorless and neutral. The filter is then pierced through and the crystals washed down in a test-tube or a small Erlenmeyer with hot water. A few drops of hydrochloric or sulphuric acid are now added to the liquid and the latter kept in a boiling water-bath for about half an hour. The solution is cooled and to small quantities of it are applied the following reactions of identification:

a. On the addition of potassium iodide, picric acid or potassium bichromate a bulky precipitate should be formed.

b. A few drops of chlorine water produce a red color.

If potassium iodide gives a precipitate in the original aqueous extract, but test No. 2 gives negative results, the original liquid cannot contain more than 0.1 per cent. of berberine. In order to detect smaller quantities proceed according to test No. 3.

3. To 10 or 20 Cc. of the original aqueous extract, add an excess of a 20 per cent. solution of potassium iodide, set aside for about half an hour, collect the precipitate on a small filter and wash thoroughly with water containing about 1 per cent. of potassium iodide. Now pierce the filter, run the precipitate into a very small flask or test-tube, reduce the liquid by boiling to about 2 Cc., add 1 Cc. of acetone and a few drops of potassium hydrate. On setting the liquid aside for a few hours, the crystalline acetone compound will make its appearance, either directly or after dilution of the liquid with double the amount of water and letting stand a few hours. The acetone compound is then treated exactly as in test No. 2 for the identification of the alkaloid. By this method the author has determined the presence of berberine in the following plants:

Berberis vulgaris; *Berberis aquifolia*; *Hydrastis canadensis*; *Xan-*

thorrhyza applifolia; and *Coptis trifolia*. He has found the following:

Cocculus palmatus (Calumba root); *Pareira brava*; *Menadensis*, and *Jeffersonia diphylla*.—Drug. Circ., Feb., 1902,

Berberine—Precautions in Estimation.—In a previous proceedings, 1901, 238), H. M. Gordin had given two methods of titative estimation of berberine. In both methods the berberine is extracted from the drug by hot alcohol; but in one of them the solution is made up to a definite volume, filtered and in an aliquot of the alcoholic filtrate the berberine is precipitated as an ammonium salt which is afterwards converted into the monacid hydriodide. In the second method the alcoholic extraction is concentrated to a definite volume, made up to a definite volume with water (to 500–600 Cc. of the drug), the liquid shaken with a little talcum (about 5 Gm.) for an hour, and in an aliquot part of the filtrate the berberine is precipitated by an excess of potassium iodide, which is finally converted into the line acetone-berberine under the directions given. Since applying both methods, Mr. Gordin found that whereas some drugs, such as *canadensis*, contain berberine in a form that is easily soluble in others, such as some samples of barberry bark, the berberine is in a form which is very difficultly soluble in cold alcohol, so that it is not possible to make up the alcoholic extract with cold alcohol to a definite volume, as required by the first method, without leaving some of the berberine as residue. It is therefore important, whenever the first method is applied, to take care that no berberine containing residue be left, this is determined by making a clear solution in water by the aid of talcum, and adding the filtrate with potassium iodide. If evidence of berberine is found, then the second of the methods is applied—a method which is applicable in either case. The author also suggests as an improvement in the first method, that the berberine acid sulphate be collected on a paper filter in a funnel, washing it completely into the funnel with two or three 5 Cc. of a mixture of equal parts of ether and alcohol, and then washing it with pure ether, in which the acid sulphate is completely soluble. The small proportion (0.0006 Gm.) soluble in the 10 Cc. of alcohol can be entirely neglected.—Amer. Jour. Pharm., Jan., 1902,

Berberine—Physiological Action.—According to Mosse and others, berberine acts as a powerful poison on animals, causing atrophy and paralysis, reducing the reflex action of the nervous system, and producing various nervous affections. This is followed in a short time by nephritis and necrosis. In frogs, the action of strychnine was arrested or modified by berberine. It also arrests the development of bacilli and fungi moulds.—Pharm. Journ., Jan. 18, 1902, 41; from Chem. Ztg. 1902, 10.

Canadine—Its Chemical Relation to Berberine.—J. C.

studied the chemical relations of canadine, the third alkaloid of hydrastis, first mentioned by L. Hale, to berberine. The existence of this third alkaloid was disputed by Lloyd and B. F. Power, until E. Schmidt (see Proceedings, 1888, 563, and 1892, 575) isolated and described its chemical relationship to berberine, naming it canaline. He found it to have the composition $C_{20}H_{21}NO_4$, differing from berberine in containing 4 atoms more of hydrogen, and that it was convertible into the latter by treatment with iodine in alcohol, which removed these 4 atoms of hydrogen. The berberine so obtained possessed all the characters of the natural berberine, and it was expected that when the 4 atoms of hydrogen were again introduced, by reduction with zinc and sulphuric acid, canadine would again be produced. Instead of that he obtained the hydroberberine, which had been previously obtained by Hlasiwetz and Gilm; and while these two are isomeric bodies, they differ in their melting points (that of canadine being 132.5° C., that of hydroberberine 166° – 167° C.), and in that canadine is optically strongly laevogyre, while hydroberberine is optically inactive. Gadamer has now succeeded in splitting hydroberberine by the aid of bromo-camphorsulphonic acid into laevo- and dextro-rotatory canadine, the laevorotatory product being identical in all respects with natural canadine. Its melting point is 132.5° C., and its rotation $[\alpha]_D^{20} = -298^\circ$. The dextro rotatory modification deflects the same number of degrees (298°) to the right, but it melts at 139° – 140° C. This peculiarity in the optical activity of the two modifications, the one -298° , the other $+298^\circ$, explains the optical inactivity of the hydroberberine, the two components neutralizing each other. Both modifications are weak bases. The alkaloid berberine itself is a strong quaternary base, and the constitutional formula assigned to it is in full accord with all of its properties and of its derivatives.—Arch. d. Pharm., 239, No. 9 (Dec. 13, 1901), 648–663.

Corydalis Alkaloids—Enumeration and Grouping of the Different Ones Obtained from Corydalis Cava.—J. Gadamer publishes the results of a comprehensive investigation of the alkaloidal constituents of the tubers of *Corydalis cava*, which appear to be far larger in number than has been supposed. The alkaloids heretofore studied and described are :

1. Corydaline, $C_{22}H_{27}NO_4$, melting at 134.5° C.
2. Corybulbine, $C_{21}H_{25}NO_4$, melting at 238° – 239° C.
3. Corycavine, $C_{23}H_{23}NO_6$, melting at 216° – 217° C.
4. Bulbocapnine, $C_{19}H_{19}NO_4$, melting at 199° C.
5. Corytuberine, $C_{19}H_{25}NO_4$, melting at over 200° C.

6. Besides these E. Merck called attention to a sixth alkaloid, amorphous, which he named Corydine; but this is probably not a single body. To these Gadamer has now added other bases, which are described in the present paper, namely :

7. Isocorybulbine, $C_{21}H_{25}NO_4$, melting at 179° – 180° C.
8. Corycavamine, $C_{21}H_{21}NO_5$, melting at 148° – 149° C.

9. A crystalline base having the melting point of 135° C.
10. An amorphous base, forming a crystalline hydrochloride.
11. An amorphous base, forming amorphous salts, and evidently not a single body.

Leaving the amorphous bases out of consideration the author has been able to divide the corydalis bases into three groups, the individual members of which are well characterized, viz. :

1. *The Corydaline Group*, feeble bases, convertible by oxidation with alcoholic iodine solution into berberine-like compounds. To this belong *corydaline*, *corybulbine* and *isocorybulbine*.

2. *The Corycavine Group*, moderately strong bases, resistant to the action of iodine solution. This consists of *corycavine* and *corycavamine*.

3. *The Bulbocapnine Group*, relatively the strongest groups, which, although oxidized by iodine solution, do not yield well characterized oxidized products. This embraces *bulbocapnine*, *corydine* and *corytuberine*.

The author describes the improved method of extracting the alkaloids employed by him, which has enabled him to obtain over 400 Gm. of total alkaloids from 10 kilos of the tubers, as against 108 Gm. obtained by H. Ziegenbein in 1894, 90 Gm. obtained by Martindale in 1897, and 168 Gm. obtained by H. Wagner in 1898, from the same quantities. The details of the method must be consulted in the original. It may suffice here to state that it consists in prolonged extraction with alcohol in a Lenz's extraction apparatus, fractional extraction of the extract, after adding acetic acid, with ether under certain explicit directions, crystallization of the mixed alkaloids from alcohol, which yields corydaline, bulbocapnine, corycavine and corybulbine in crystals, and an amorphous mixture of bases containing in addition to some of each of these, the remaining bases previously enumerated as constituents, with the exception of *corytuberine*.

This is obtained from the extracts, after extraction with ether, by shaking out with chloroform. The amorphous alkaloids are separated from each other by converting them into salts and subjecting the mixture of alkaloidal salts to fractional crystallization. The bulk of the author's voluminous paper is devoted to the detailed description of the investigation of the individual alkaloids in which he was assisted by H. Ziegenbein and H. Wagner.—Arch. d. Pharm., 240, No. 1 (Jan. 17, 1902), 19–52, and No. 2 (Feb. 27, 1902), 81–113.

Corydaline—Chemical Formula and Constitution.—In a paper read before the British Chemical Society, Drs. Dobbie and Lauder state that the chemistry of corydaline, the alkaloid of the Tyrolean plant, *Corydalis cava*, is now almost completely worked out. The authors have been able to assign a highly probable constitutional formula to it, although its synthesis is still probably remote. The alkaloid has the formula $C_{27}H_{27}NO_4$, all the oxygen being present as methoxyl, since hydriodic acid produces from one molecule of the base four molecules of methyl iodide. The pro-

ducts of oxidation, however, furnish the greatest insight into the structure of the substance, and the scheme exhibited in the authors' paper (not here reproduced) shows succinctly their inter-relations. It is interesting also that corydaline, which in its composition closely resembles berberine, is colorless like the tetrahydro or fully reduced berberine, while dehydrocorydaline is, like berberine, intensely yellow.—Chem. and Drugg., Dec. 28, 1901, 1022.

Chelidoxanthin—Identity with Berberine.—J. O. Schlotterbeck, in the course of examinations connected with his investigation of *Stylophorum Diphyllum* (see Proceedings, 1901, 251) made in conjunction with H. C. Watkins, observed a close similarity between a crystalline yellow coloring matter found by them in that plant and the chelidoxanthin isolated by Probst from *chelidonium majus*; indeed, there was strong reason to suspect the identity of the two. Mr. Schlotterbeck has since continued his investigation upon large quantities of material of undoubted source and quality, and now makes the preliminary statement that the coloring compound obtained from *Stylophorum Diphyllum*, before purification, answered the description of the coloring matter which Probst separated in small quantity from chelidonium and named chelidoxanthin, but that when completely purified it is identical with the alkaloid berberine. Fresh plants of *chelidonium majus* from the botanical garden of the University of Michigan are now being examined for berberine.—Pharm. Rev., Jan., 1902, 4-5.

Chuchuarine—A Poisonous Alkaloid from Senecarpus Anacardium.—Moreau has isolated from an East Indian aphrodisiac plant, *Senecarpus anacardium*, a highly poisonous alkaloid, to which he has given the name "chuchuarine," after the local name of the plant. It forms white octahedral crystals, and is stated to have the formula $C_{20}H_{16}N_2O_2$. A dose of 0.001 Gm. administered to a dog weighing 15 Kgm. caused death within a few minutes. Given in minute doses, in aqueous solution, chuchuarine excites the generative organs without, however, producing the secondary effects observed after the administration of cardol or cantharidin.—Pharm. Ztg., Aug. 21, 1901, 674; from Pharm. Rdsch., 1901, No. 33.

Allantoine—Occurrence in the Leaves and Bark of Cordia Excelsa.—Thoms finds that the so-called cordianine, which von Peckholt isolated from the fresh leaves and bark of *Cordia excelsa* with alcohol, is identical with allantoine, $C_4H_6N_4O_3$, a base which has been found in the amniotic liquor of animals, and in the urine of new-born children, but has also been isolated from other plants: by Schultze and Barbieri in the shoots of *Platanus orientalis* grown in water, and by Schultze and Bosshart in the bark of the horse-chestnut. The fresh leaves of *Cordia excelsa* yield 0.266 per cent., and the fresh bark 0.78 per cent. of the base, which by repeated recrystallization is obtained in white crystalline columns. Allantoine is

doubtless formed in animals by the oxidation of u plants, it is probably derived from 'vegetable alb Dec. 14, 1901, 663; from Pharm. Post, 34, 634.

Pilocereine and Cereine—*Two New Alkaloids in which see under "Materia Medica."*

Aethylendiamine-Carbonate—*An Efficient Solve* process has been patented in Germany for the pro diamine-carbonate," which is stated to be an efficie. This process consists simply in passing carbon cent. alcoholic solution of ethyldiamine under refri. The carbonate, which separates out during this tre condition, is collected on a filter, washed with Pharm. Centralh., Nov. 28, 1901, 749.

Acetanilid—*Necessity of Pharmacopæial Directio*
Melting Point.—Lyman F. Kebler thinks that it method of taking the melting point of acetanili detail, as discordant results are generally repo directions. Most commercial samples melt somewt is due chiefly to the mechanically retained moist should be carefully dried at 100° C. before the melt should also be noted that acetanilid visibly softens its melting point.—Amer. Drugg., Dec. 9, 1901, 343

Diphenylcarbazide (Phenylhydrazine)—*Violet Col with Chromic Acid*.—P. Cazeneuve describes vi obtained by the interaction of diphenylcarbazide a duced under the following conditions: The solut strongly acidified with acetic acid, and a few grains or its acetate are added, when, on agitation in the c color is developed. This reaction is trustworthy, that even 1 part in 1,000,000 may be detected v reaction with that of any other metallic body. The is best obtained, in substances, by employing urea pro carbazide, in the following manner: 12 grams of the 25 grams of hot acetic acid and 25 grams of wate equimolecular proportion was gradually added; that in 50 grams of water. Carbonic acid is given off, a the liquid takes a deep violet tint. On cooling material is deposited. The supernatant liquid is dec is taken up with hot alcohol, and the coloring matte on cooling—this process being repeated several time coloring matter was obtained by the author by u quantity of chromic acid; the resulting body contain of chromium, against 5.62 or 5.5 in the former one.

however, possess the same properties with regard to dyeing.—Chem. News, April 4, 1902, 165 ; from Bull. Soc. Chim. de Paris (3), xxv, No. 15.

Phenylcarbazinate of Phenylhydrazine—Formation and Characters.—P. Freundler states that the phenylcarbazinate of phenylhydrazine is formed when the latter base is in the presence of an excess of carbon dioxide. The yield depends on the concentration, but cannot exceed 65 per cent. of the theoretical quantity, which, from 20 Gm. phenylhydrazine is 24 Gm. It occurs in the form of a white crystalline powder, slightly soluble in cold water, but decomposed by hot water, as well as by alcohol ; it fuses at 80° C.—Chem. News, April 25, 1902, 203 ; from Bull. Soc. Chim. d. Paris (3), xxv, Nos. 18–19.

Phenazone, Sodium Salicylate and Magnesium Sulphate—Incompatibility in Solution.—J. P. Gilmour calls attention to the formation of a sparingly soluble crystalline compound, the exact nature of which remains to be determined, when phenazone, sodium salicylate and magnesium sulphate are dispensed together in aqueous solution. The original prescription also contained potassium bromide, but this was found to play no part in the reaction. No incompatibility was observed when any two of the ingredients, for example the magnesium sulphate and either of the others, or the phenazone and sodium salicylate, were dissolved together.—Pharm. Journ., Jan. 11, 1902, 22.

In response to Mr. Gilmour's request, W. J. Uglow Woolcock has undertaken experiments with the object of determining the nature of the precipitate produced under the conditions explained. The crystals obtained were washed till free from sulphate, and dried under 100° C. That these really were a compound of magnesium, phenazone, and salicylic acid was then proved as by Mr. Gilmour. A qualitative experiment showed that the residue left on incineration consisted of magnesium oxide. A gravimetric determination of the amount of magnesium present was therefore carried out ; a weighed quantity of the substance was incinerated in a crucible, and the residue weighed as MgO. From this the presence of 3.79 per cent. of Mg was calculated.—Pharm. Journ., Feb. 22, 1902, 143.

Thiopyrine and Selenopyrine—Formation from Antipyrine and Characters.—In the course of their investigations regarding the constitution of antipyrine, A. Michaelis and R. Pasternack determined that it was quite feasible to introduce two atoms of chlorine in place of the oxygen atom of the antipyrine molecule and to re-introduce the oxygen atom in place of the two atoms of chlorine by treatment of the antipyrine chloride with alkali. It occurred to them that it was equally feasible to replace the two chlorine atoms by one atom of sulphur or selenium instead of oxygen, and they have demonstrated that this can be accomplished if the alkali is replaced by potassium hydrosulphide or hydroselenide, the reaction taking

place even with greater facility. These two compounds have been prepared by Michaelis, Bindewald and Stein, who describe them as follows:

Thiopyrine, $C_{11}H_{12}N_2S$, forms monoclinic crystals, which melt at 187° . It is moderately soluble in cold water, but readily soluble in alcohol, chloroform, diluted acids and glacial acetic acid, and in soda solution, hot amyl alcohol, toluol, and benzol, and in ether and ligroin. It is distinguished negatively from solutions failing to become green with nitrous acid nor ferric chloride, while positively it is distinguished by the following some and characteristic reaction: The formation of an orange color on addition of sulphurous acid to its solution, followed by a more or less rapid development of a yellow crystalline precipitate of composition $C_{11}H_{12}N_2S, SO_2$. Physiological experiments by Heinly show thiopyrine to have similar action to antipyrine, but more energetic.

Selenopyrine, $C_{11}H_{12}N_2Se$, forms hard, shining, light yellow crystals, which are probably isomorphous with the crystals of thiopyrine, and melt at 187° . It dissolves in water, chloroform, and alcohol with tolerable facility, but is difficultly soluble in benzol, toluol, and ether. No red color is produced on addition of ferric chloride to its aqueous solution, but by the addition of a faint yellowish-green color is produced. Its reaction with sulphurous acid is similar to that of thiopyrine, a yellow crystalline precipitate being produced.—Pharm. Ztg., March 5, 1902, 180; from Liebig's Chem. Ztg., 1902, 320, No. 1.

Salophen (Acetylparaamidophenolum Salicylicum)—Characteristics.—The Swiss Pharmacopœia Commission characterizes salophen as follows: White or faint yellowish, crystalline, odorless and tasteless powder, giving a neutral reaction. Sparingly soluble in cold water, soluble in alcohol, ether and aqueous alkaline solutions. Melting point 187° – 188° . A solution in dilute sodium hydrate is boiled and allowed to cool, a blue beginning on the surface, becomes blue. This color is destroyed by renewed boiling, and reappears on cooling. When this solution is saturated with hydrochloric acid and shaken out with ether, a blue is obtained on evaporating the ether, which, dissolved in alcohol, gives a violet color with ferric chloride. On adding to the liquid a little 3 per cent. aqueous solution of sodium carbonate and some filtered solution of chlorinated lime, the liquid becomes blue on supersaturation with ammonia dirty blue. If salophen is dissolved in water and some alcoholic potassa solution, a distinct odor of salicylic acid is developed on acidifying it with hydrochloric acid. Very little ferric chloride solution added to an alcoholic solution of salophen gives a violet coloration, rapidly changing to brown-yellow. On shaking with water and filtering, the filtrate must not give a color with ferric chloride, nor any change on addition of silver nitrate.

forms a colorless solution with concentrated sulphuric acid. Heated on platinum foil, it burns, leaving no residue.—Pharm. Ztg., Mar. 19, 1902, 220.

Phenolphthalein—Inefficiency as an Indicator for Standardizing Potash Solutions.—C. A. Jungclaussen calls attention to discrepancies observed in acidimetric and alkalimetric determinations carried out under the directions of the Germ. Pharm., iv, which are made with phenolphthalein and iodeosin as indicators.

GLUCOSIDES AND NEUTRAL PRINCIPLES.

Convolvulacea-Glucosides—Decomposition Products.—N. Kromer, in continuation of his duties of the chemical constitution of the convolvulaceæ glucosides, finds that α -methyl- β -oxybutyric acid is produced by the action of barium hydrate upon jalapin. By the action of acetic anhydride under conditions explained upon jalapin and on jalapinic acid he obtained the corresponding acetyl compounds.

Acetyl-Jalapin is a yellow amorphous body, having the same physical properties and solubilities as jalapin, but is somewhat more brittle.

Acetyl-Jalapinic Acid, in contrast to the mother-substance, jalapinic acid, is insoluble in water, amorphous, light-yellow, and capable of being drawn out into silky-glistening threads. In its external characters it shows complete analogy to the convolvulacea resins. Concerning the acid body which M. Hoehnel has obtained by the action of bases on convolvulin, and which has been named.

Purginic Acid, Kromer finds that it is essentially composed of α -methyl- β -oxybutyric acid, in admixture with the anhydride of the same acid. According to Hoehnel purginic acid, which is formed along with convolvulinic acid, possesses the nature of a glucoside, which on hydrolysis yields an uncrystallizable hexose, and two acids, one a liquid having the composition of decylenic acid, the other of the composition of oxylaurinic acid. Kromer is at present unable to decide whether purginic acid is to be regarded as a primary or a secondary product of hydrolysis, but is inclined to favor the latter view.—Arch. d. Pharm., 239, No. 5 (July 6, 1901), 373–392.

Aloin—Variation.—Lyman F. Kebler states that the aloins at present supplied vary very materially, as the following melting points of a number of samples will show: 106.6, 82.2, 105, 100, 108, 96, 155, 120, 118. On noting the above melting points it should not require much argument to show that a melting point for aloin is much needed. It should not be below 105° C., nor could we expect an article to be supplied having a melting point of 155 C., inasmuch as the article having this high melting point was especially prepared and was therefore very pure. If a distinct plant principle deserves recognition by the Pharmacopœia, it seems to the author that every possible requirement should be introduced which will make this article uniform.—Amer. Drugg., April 28, 1902, 215.

Anthrapurpurine-diacetate—A New Synthetic Purgative. Ewald has called attention of the XIX. Congress for International Hygiene to a new synthetic product which, on account of its close relationship to the well-known group of vegetable purgatives—cathartins, chrysophanic acid, emodin, aloin, etc., and its pronounced purgative effect, is fair to replace these because of the facility with which it is obtained in a uniformly pure form and of constant composition. It is the diacetyl derivative of anthrapurpurine, or trioxyanthraquinone, the latter being the coloring matter of madder known by the name of "puergerin." Dioxyanthraquinone is an isomer of the coloring matter "puergerin." The natural cathartic bodies mentioned have by the recent investigations of Tschirch been shown to be derivative of anthraquinone, and the trioxyanthraquinones. Thus emodin is trioxymethylanthraquinone, and can also be split off from barbaloin, while chrysophanic acid is dioxymethylanthraquinone. Modern investigations have shown that these natural bodies produce painless evacuations because they are split up until they reach the intestinal tract, while both trioxyanthraquinone, although exercising as strong a purgative effect as the others, in instance, are unsuitable because of the violent colic effects produced by them. The problem to be solved therefore was to convert these compounds into compounds which would not split up until they reached the intestine. This has been solved in the production of the new acetyl derivative, the diacetyl derivative, in consideration, which has been introduced by its manufacturer under the name of

Purgatin. It occurs in form of an orange colored, crystalline, ponderable powder, melting at 175° – 178° C., insoluble in dilute acids, but slowly soluble in weak alkali and splits up with the development of a deep violet red coloration. It is therefore not active until it reaches the intestinal tract, where, being slowly split up, it produces painless peristaltic action. It is administered in doses of 0.5 Gm., preferably in form of tablets, but under circumstances, according to individual idiosyncrasy, doses of 1.0 or even 2.0 Gm. may be ineffective.—Pharm. Centralh., July 11, 1901, 423–425.

Artemisin.—A constituent accompanying santonin from

Artemisia maritima.—P. Bertolo has examined artemisin, and has shown it accompanies santonin in *Artemisia maritima*, and is separated from the mother liquors after separating the former compound. Artemisin occurs in colorless crystals melting at 200° C. It combines with carbon tetrachloride to form the compound $C_{15}H_{18}O_4 \cdot HCCl_3$, from which the artemisin is driven off at 80° C. When boiled with solution of soda it forms a brownish red solution, which is colorless when cold; by treating with dilute H_2SO_4 artemisin is liberated, but if concentrated H_2SO_4 is used a talline body melting at 170° – 171° C. is obtained. Artemisin

monobasic acid, the silver salt having the formula $C_{14}H_{19}O_3COOAg$. It gives with hydroxylamine the oxime $C_{15}H_{18}O_3NOH$, crystallizing in white needles which melt at 233° – 234° C., and forms a semi-solid hydrazone with phenylhydrazine. Like santonin, $C_{15}H_{18}O_3$, from which it differs only in having one atom more oxygen, it contains a lactone and a ketone group in the molecule.—Pharm. Journ., April 12, 1902, 294; from Chem. Centrabl., 72 [2], 937.

Cantharidin—Non-Volatility in Benzin Vapor.—In order to determine whether cantharidin is volatilized with the vapor of benzin, which is employed in the preparation of certain plasters, 0.5264 Gm. of pure crystallized cantharidin and 50 Gm. benzin were distilled together by K. Dieterich, first in a water-bath and then in a paraffin bath, the residue being finally dried at 100° C. It weighed 0.5262 Gm., thus practically proving that cantharidin is not vaporized with benzin.—Pharm. Centralh., Aug. 1, 1901, 464; from Helf. Annal., 1901.

Cereinic Acid.—A new saponin from *Cereus gummosus*, see *Californian cactaceas*, under "Materia Medica."

Verbascum-Saponin.—The active constituent of the fruits (employed as fish-poison) of *Verbascum sinuatum*, L., which see under "Materia Medica."

Cumarin and Vanillin—Adulterations.—Lyman F. Kebler notes an adulteration of cumarin with acetanilid, and adulterations of vanillin with the same substance, with broken crystals of acetyl iso-eugenol, and, to the amount of 90 per cent., with specially prepared benzoic acid. Adulteration of vanillin to the extent of 50 per cent. with acetanilid is of frequent occurrence. It is detected by the odor of aniline which is developed when the suspected sample is heated with a 5 per cent. solution of potassium hydrate for one hour, and by the blue color reaction, characteristic of aniline, developed on addition of calcium hypochlorite to this mixture. The benzoic acid was easily detected by the odor, solubilities and melting point. The presence of acetyl iso-eugenol was established by the abnormal crystals revealed under the microscope; by the development of a beautiful red color with concentrated sulphuric acid, instead of the lemon-yellow characteristic of vanillin; by estimating the vanillin by the method of Prescott and Hess, as modified by the author (see Proceedings, 1899, 761); by the presence of acetic acid, and by abnormal solubilities.—Amer. Journ. Pharm., Jan., 1902, 14–16.

Cumarin and Theine (Caffeine)—Micro-Chemical Determination.—Nestler has extended a method, previously devised by him for the micro-chemical determination of theine direct from the substance containing it, to the determination of cumarin. The method, which is quite simple, consists in heating the sample under examination for about 5 to 15 minutes in a watch-glass covered with a glass slide at a temperature of 40°

to 70° C. The sublimate on the slide is then tested microchemically in the usual way. The method is applied to *Dipterix odorata* (tonka bean), *Agerachloa australis*, *Hierochloa odorata*, *Anthoxanthum mahaleb*, *Ilex paraguariensis* (mate, Paraguay-tea, and roasted), *Cola acuminata* (cola-nuts), *Paulownia* (paste), and *Theobroma cacao*. The author, further

Vanillin may be estimated in *Vanilla planifolia* with equal facility.—Pharm. Centralh., Dec. 5, 1901. d. D. Botan. Ges., 1901, 350.

Vanillin—Characterization.—In reply to a “Gordon advocates the introduction of vanillin into the Pharmacopoeia, the following characterization: Vanillin should consist of needle-like crystals, in stellate tufts, free from color, melting at 79° to 81° C., boiling point (in CO₂) 285° C. It is soluble in water (20 parts at 75° C.), alcohol, ether, chloroform, and ammonia water, the latter solution being clear. Vanillin has appeared adulterated with benzoic acid, acetophenone, acetyl-iso-eugenol (its synthetic antecedent) and other articles, including granulated sugar. The various methods for establishing the absence of the impurities mentioned are given by the author.—Proc. Pa. Pharm. Assoc., 1901, 127-129.

Dhurrin.—A glucoside yielding hydrocyanic acid from *Sorghum vulgare* under “Materia Medica.”

“*Digitalinum Germanicum*”—*Components.*—The *Digitalinum Germanicum*,” as supplied by Merck, has been examined by H. Kiliani, who confirms, as has previously been stated by Cloetta, that this digitalin is not a single body, but is composed of digitalin constituents, and among these particularly a so-called “digitalinum verum.” He communicates that these two important constituents may be separated from the accompanying digitalein. In conjunction with the author also adds a new method for the preparation of digitogenic acid.—Pharm. Ztg., April 26, 1902, 326.

Lotusin.—A glucoside yielding hydrocyanic acid from *Lotus arabica* under “Materia Medica.”

Santonin—History and Chemistry.—In a paper on the pharmacology of the santonin group, Dr. E. Wedekind discusses the history of santonin and of its industrial preparation, its general therapeutic uses and chemical relations. He recalls that it was first prepared in 1830 by Kahler and Alms independently, in

recommended as an efficient anthelmintic by Mayer in 1839, in consequence it was soon produced on an industrial scale by E. Merck, who appears to have had a monopoly of its production until 1870, when others also engaged in its manufacture. This industry particularly developed by Russian manufacturers, first at Orenberg (1883) and a year later at Tschimkent (Turkestan) in order to be in close proximity to the fields where the *artemesia* species yielding santonin grow in great profusion. Omitting the author's description of the technical production, general characters and therapeutic uses of this interesting substance, the following resume of its chemical relations as revealed by the researches of a number of Italian chemists—Cannizzaro, Cernelutti, Andreocci, Francesconi and others—may find place here.

Santonin is the lactone of *santoninic acid*, the latter being split at 120°C . into water and *santonin*; these two bodies having the same relation to each other as cumarin and cumarinic acid, with this distinction that santoninic acid has also the character of a ketone. Santonin and its derivatives are *naphthalin-derivatives*, because by reduction we finally produce *dimethyl- β -naphthol*; at the same time *propionic acid* is also split off. The author shows in detail the successive steps that lead from the probable constitutional formula of santonin finally to dimethyl- β -naphthol and exhibits in a kind of genealogical table the various derivatives of santonin that have so far been identified and described. Briefly these are the following:

Santonin (m. p. $169\text{--}170^{\circ}\text{C}$.) or *Santoninic Acid* (splitting up at 120°C .) yields by the action of barium hydroxide, *santoninic acid*; by the action of HCl, *desmotroposantonin*; by the action of H_2SO_4 , *isosantonin*; and by the action of sunlight, *photosantoninic acid* and *isophotosantoninic acid*, which is lactonated at 100°C .

Santoninic Acid (m. p. $161\text{--}163^{\circ}\text{C}$.), isomeric with santonin but incapable of forming a lactone, yields by the action of IH and P , α - and β -*meta-santonin* (m. p. 160.5° and 136°C . respectively); by the action of acetic anhydride, at 180°C ., it yields *santonid* (m. p. 127°C .), and at 260°C ., it yields *parasantonid* (m. p. 110)—the latter yielding by the action of NaOH, *parasantoninic acid*. By distillation in vacuo santoninic acid yields *metasantoninic acid* (m. p. $161\text{--}167^{\circ}\text{C}$.).

Desmotroposantonin (m. p. $259\text{--}260^{\circ}\text{C}$.) is also isomeric with santonin, but forms a lactone, *isodesmotroposantoninic acid* (m. p. $187\text{--}188^{\circ}$ as lactone).

Isosantonin (m. p. $137\text{--}138^{\circ}\text{C}$.) yields by the action of Na_2CO_3 the before mentioned *metasantoninic acid*.

Photosantoninic Acid ($\text{C}_{15}\text{H}_{22}\text{O}_6$, m. p. as lactone $154\text{--}155^{\circ}\text{C}$.) yields on heating in a current of CO_2 , *pyrophotosantoninic acid* ($\text{C}_{14}\text{H}_{20}\text{O}_6$, m. p. 94.5°), and by the action of HCl, *dehydrophotosantoninic acid* ($\text{C}_{15}\text{H}_{20}\text{O}_6$, m. p. $132\text{--}133^{\circ}\text{C}$.).

The studies of the chemists mentioned lead to the various bodies belonging to the santonin group possess the terpenes and camphors.—Pharm. Ztg., July 27, 1901.

Santonin—Improvement of the B. P. Test.—The E depending on the violet red color produced when is added to its warm alcoholic solution, is objected because many other substances afford a similar reaction. A comparatively large amount of santonin is required to give a color. He finds that if a few crystals of santonin are added to a tube with 2 or 3 Cc. of the official (B. P.) solution of rose-red color is produced on addition of a few drops of KOH. This test is characteristic, and excludes such bodies as camphor which both give the red color direct, while santonin gives no color until the KOH solution is added. It is also qualified by adding one milligram of santonin.—Trans. Brit. Pharm. C.

Scutellarin—A Constituent of Different Labiates.—Goldschmidt have obtained from *Scutellaria* and a number of other plants an identical body, to which they give the name scutellarin in all of the different *Scutellarias*, being most abundant in the epidermis of the leaf, but found also in the roots, stem and seed of the plant. It was further obtained from the leaves of *Glechoma* and of *Teucrium chamaedrys*, L. In *Scutellaria altissima* cinnamic and fumaric acid could also be established. Scutellarin is obtained by boiling freshly gathered leaves for 15 minutes in ten times the quantity of water, filtering the decoction and adding from 1 to 2 drops of chloric acid, which causes an abundant precipitate of considerable quantity. If precipitation is effected from the decoction the scutellarin separates in the form of stellate-, bunchy- or granular precipitates of light yellow crystals. The author provides the formula $C_{21}H_{16}O_{11}$ to the crude scutellarin so obtained. Scutellarin gives a red precipitate with lead acetate and an intense red color with ferric chloride, changing on heating to a red color if the ferric chloride is sent in great excess; alcoholic potassium or sodium hydroxide, acetates, produce red-yellow precipitates, which change on exposure to air to a spinach-green. Baryta water has the same color and a red color is produced immediately if an oxidizing agent, such as bromine water is added.—Pharm. Ztg., Dec. 4, 1901, 1902, Pharm. Chem., 1901, No. 6.

COLORING MATTERS.

New Yellow Coloring Matters—Description.—A. G. Briggs have examined the yellow dyewood known as gambia, which is probably obtained from *Excoecaria glandulosa* or *Jatropha gossypifolia* and was until recently employed in this country. The

crystalline coloring matters — excoecarin and iacarandin — in minute quantity.

Excoecarin, $C_{13}H_{12}O_5$, occurs in yellow needles (m. p. 219° – 221° C.), and is described as a weak, substantive dyestuff with animal fibres. It forms a tribenzoyl compound, $C_{13}H_9O_5(C_7H_5O)_3$, which forms colorless needles (m.p. 168° – 171° C.) and a dimethyl ether, m.p. 117° – 119° C., yellow needles, giving fluorescent solutions. On fusion with alkali, it yields hydro-toluquinone ($CH_3:O:O=1:2:5$), and hydroquinone carboxylic acid, the latter being apparently derived from hydrotoluquinone. Treated with bromine in presence of alcoholic potassium acetate, it forms excoecarone, $C_{13}H_{10}O_5$, the copper colored needles (m.p. about 250° C.) of which are reconverted into excoecarin on reduction. Alcoholic quinone solution gives a similar compound ($C_{13}H_{14}O_7$?) in green leaflets (m.p. 190° C.), which is possibly a quinhydrone derivative.

Iacarandin, $C_{14}H_{12}O_5$, occurs in yellow plates (m.p. 243° – 245° C.), resembles luteolin in dyeing property, and gives a diacetyl derivative, $C_{14}H_{10}O_5(C_2H_3O)_2$, in yellow needles (m.p. 192° – 194° C.), and a dibenzoyl derivative, $C_{14}H_{10}O_5(C_7H_5O)_2$, in yellow prismatic needles (m.p. 167° – 169° C.). With alcoholic potassium acetate yellow needles of the salt, $C_{22}H_{22}O_{10}K$, result, and on fusion with alkali an acid, apparently derived from catechol, is formed. The wood also contains two orange-colored resins, one of which is a yellow dyestuff, while the other is devoid of any tinctorial property. Mr. Perkin also gives further information regarding

Myricetin, the yellow coloring matter obtained by him some years ago from the bark of *Myrica nagi*. When air-dried myricetin has the formula $C_{15}H_{10}O_8, H_2O$, is anhydrous at 160° C., and melts at about 358° C. The compound previously obtained by the action of bromine is tetrabrom-myricetin, $C_{15}H_6Br_4O_8$, and is converted by hydriodic acid into myricetin. Myricetinpentamethyl ether, $C_{15}H_5O_8(OCH_3)_5$ —m. p. 138° – 139° C.—forms a monoacetyl derivative, $C_{15}H_4O_8(OCH_3)_5(C_2H_3O)$, which occurs in colorless needles (m. p. 167° – 170° C.) and on decomposition gives gallic acid trimethyl ether and phloroglucinol monomethyl ether, the latter identified by diazobenzene derivative (m. p. 250° – 252° C.). Myricetin-hexaethyl ether— $C_{15}H_4O_8(OC_2H_5)_6$ almost colorless needles, m. p. 149° – 151° C., yields gallic acid triethyl ether and a phenol, probably phloroglucinol diethyl ether (azobenzene compound yellow needles, m. p. 163° – 165° C.). Acetyl-myricetin melts at 211° – 212° C. and not at 204° – 206° as previously stated. The name myricetrin is given to a new glucoside which occurs in the bark of the *Myrica nagi*, and is decomposed by acid into myricetin and rhamnose $C_{21}H_{22}O_{13} + H_2O = C_{15}H_{10}O_8 + C_6H_{14}O_6$. It closely resembles quercitrin, and its formula when air-dried is $C_{21}H_{22}O_{13}, H_2O$; at 160° C. it is anhydrous and then occurs in pale yellow leaflets (m. p. 199° – 200° C.), $C_{21}H_{22}O_{13}$.—Pharm. Journ., Feb. 1, 1902, 81; from Proc. Chem. Soc., 18, 11.

Boletol—A Chromogen Occurring in certain
 Gabriel Bertrand, the chromogen boletol, to which the blue color when the tissues of certain *Boleti* are due, is not a nitrogenized body, as previous investigators have supposed. The author has succeeded in isolating it, in a state of red acicular crystals, which are sparingly soluble in water, but are dissolved in hot water, from which, however, it does not crystallize on cooling. This is supposed to be due to the fact that boletol is more soluble in cold water while the crystalline body is more soluble in hot. To prevent the decomposition of boletol by the oxydase of the fungi, the fungi are cut up in small quantities at a time and are extracted with boiling alcohol and heated for half an hour. The extract obtained is precipitated first with neutral, then with acetic acid. The washed lead precipitate is then suspended in water, which removes a portion of the boletol, which is then extracted with ether, the solvent evaporated and the residue reprecipitated and purified by successive crystallizations. The lead precipitate with HCl, gives a further quantity of boletol, which is then extracted with ether. It is found that the addition of hydrochloric acid to the mother liquor in the final crystallization, results in the separation of boletol in a pure condition.—Pharm. Journ., 1901, 253; from Compt. rend., 134, 124.

Chlorophyll—Assimilation the Result of Diastasic Action
 regards the chlorophyll assimilation of green cells to be the result of the action of a special diastase secreted by the cells, and the chlorophyll-pigments under the influence of special phenomena of assimilation or synthesis, and of decomposition, are, in this view, special modes of the fermentation process. Journ., Jan. 18, 1902, 41; from Bull. Soc. Bot. Italiana, 1902, 1.

Hæmatoxylin—Reaction with Soluble Mono- and Bicarbonates
 “Y. Z.” calls attention to the distinction in the color reaction of mono- and bicarbonates on hæmatoxylin, at the beginning of the reaction, the particular shade, and the final color. Employing one per cent. solution of the soda salts, as well as ammonium carbonate, 1 to 2 drops of alcoholic solution of hæmatoxylin was added to 5 or 10 Cc. of the carbonate solution contained in a narrow test tube. In the case of the bicarbonates the reaction required many seconds before the development of color, resulting in gradually deepening carmine-red, which remained for several hours, while in the case of mono-carbonates the reaction was rapid, resulting in a purple-red, which changes with tolerable rapidity to a bordeaux-, cherry- and eosine-red, to an orange color. The reaction of ammonium sesqui-carbonate is similar to that of the bicarbonates.

and potassium, but the stability of the color produced is intermediate between that of the bi- and mono-carbonates. The color produced by sodium mono-carbonate is somewhat more stable than that produced by the corresponding potassium salts. The lakes produced by alum on addition to the products of reaction also exhibit noteworthy distinctions. Those produced by bicarbonates appear light violet, while with mono-carbonates, dark violet red lakes are produced, depending on the period of their precipitation.—Pharm. Ztg., Nov. 16, 1901, 915.

Indol—Presence and Extraction from the Tar of Beet-Root Molasses.—According to Dr. J. Boes' experiments the tar, obtained from beet-root molasses in the industrial utilization of that by-product of beet-sugar manufacture, contains indol in small quantities. It was obtained from the fraction of the tar boiling at 250° – 260° C., which had been freed from acid oils, and contained about 5 per cent. of bases. This fraction was subjected to distillation with steam, the distillate dissolved in ether, and the solution shaken repeatedly with diluted HCl to remove the aniline bases present. The ether was then distilled off, and the crude indol remaining distilled over in a current of steam. The indol was again extracted from the milky distillate by ether, the ether again distilled off, the residue dissolved in benzol, and a calculated quantity of picric acid, dissolved in benzol, added. On addition of petroleum ether, indol picrate is precipitated in a nearly pure condition. This is collected, decomposed with ammonia, distilled with steam, and the aqueous distillate, now containing pure indol, is shaken out with ether. The ether having been distilled off, the residual indol is dissolved in very little water and crystallized. So obtained, it forms leaflets which melt at 52° C., and show all the reactions that are characteristic of indol obtained from other sources.—Pharm. Ztg., Feb. 15, 1902, 131.

Myrticolorin—Identity with Osyritrin.—A. G. Perkin has re-examined the properties of myrticolorin, $C_{27}H_{26}O_{16}$, a quercetin glucoside present in *Eucalyptus macrorhyncha*, which, as described by H. G. Smith, differed mainly from osyritrin, in that the sugar derived from it appeared to be galactose. As Smith finds on re-examination that this sugar is dextrose, comparative experiments have been carried out, and the results show that myrticolorin is identical with osyritrin.—Pharm. Journ., March 29, 1902, 253; from Proc. Chem. Soc., 18, 58.

Phoenin and Phoenicëin—Two New Substances from the So-Called "Purple-Wood," *Copaivera bracteata*, which see under "Materia Medica."

Quercetagetin—Correction of Formula and Chemical Constitution.—A. G. Perkin finds that the true formula of quercetagetin—which was first isolated from the flowers of the African marigold, *Tagetes patula*, by Latour and Magnier de la Source, as a yellow, crystalline substance—is $C_{15}H_{10}O_8$. The substance melts at 318° – 320° C., gives an acetyl compound,

$C_{16}H_{14}O_6(C_2H_5O)_6$, in colorless needles, melting at 203° – 205° C., and dyes shades browner, though somewhat similar to quercetin, to which class of coloring matter it appears to belong. It contains no methoxyl group and on fusion with alkali gives protocatechuic acid and a phenol at present unidentified.—Pharm. Journ., April 12, 1902, 294 ; from Proc. Chem. Soc., 18, 75.

ALBUMINOIDS.

(INCLUDING ANIMAL PRODUCTS.)

Albumen—Metaphosphoric Acid an Excellent Reagent for its Detection in Urine.—Attention is directed in E. Merck's Annual Report for 1901, to metaphosphoric acid as a most reliable reagent for the detection of albumen in urine, as was already pointed out nearly 20 years ago by Bruylanti. If a small splinter of the glassy acid is shaken a few moments with little water and the solution added to the urine, the albumen present is at once precipitated in flakes. It is important that the solution of metaphosphoric acid be prepared immediately before use. This valuable reagent appears to have been lost sight of in recent years.—Pharm. Ztg., Mar. 8, 1902, 188.

Dried Egg Albumen—Adulteration with Amber.—In the course of an examination of dried egg albumen, R. Schultze observed an adulteration with amber in fragments of the size and appearance of the albumen itself. It is of course readily detected by its insolubility in water, and its identity established by its insolubility also, after separation from the albumen, in oil of turpentine or alcohol, and by forming with concentrated sulphuric acid a black resinous mass.—Pharm. Ztg., Aug. 21, 1901, 665.

Milk—Simple Process of Detecting Preservative.—M. Wynter Blyth recommends the following simple process for detecting the presence of added preservative in milk: To 10 Cc. of each sample of milk to be tested, and to 10 Cc. of sterilized milk known to be free from preservative, 2 Cc. of very strong solution of alkaline litmus is added. All the tubes are then examined, and if not of the same shade of blue as the control tube, semi-normal NaHO solution is added to them until the tint is identical. All are then plugged with cotton wool and heated in the water-bath to 80° C. for ten minutes. After cooling, each tube, including the control tube, is inoculated with 0.5 Cc. of a mixture of sour milk in water (1 Cc. of milk in 200 Cc. of water). They are then allowed to stand at ordinary temperatures for twenty-four hours. If the control tube be not then white, or nearly so, the series should be allowed to stand longer. The tubes of milk containing added preservative will then be found to be blue or pink, while those which are pure will be white, like the control tube.—Pharm. Journ., July 13, 1901, 33 ; from Analyst, 26, 148.

Cows' Milk—Influence of Cereal Decoctions on the Coagulum Produced

by Hydrochloric Acid.—Charles H. La Wall at a pharmaceutical meeting of the Philadelphia College of Pharmacy (October 15, 1901) exhibited the results of some experiments undertaken with the view to demonstrate the value of cereal decoction as an addition to cows' milk intended for infant nutrition. It has been recognized for some years that the addition of cereal decoctions to cows' milk has the effect of modifying the character of the curds produced when the casein is coagulated by the hydrochloric acid in the gastric juice, a fine flocculent coagulum being produced similar to that formed in mother's milk under the same conditions of coagulation, instead of the tough cheesy masses produced in cows' milk without such addition. The one question in controversy, however, has been whether conversion of the starch in the cereals has any modifying influences on the character of the curd. This question has recently been very thoroughly investigated by Dr. Franklin W. White, who found that the modification of the curd formed in cows' milk by cereal decoctions is mainly due to the unchanged starch in solution contained in them, there being no difference in the action of the various cereals, such as barley, oats, rice or wheat, and that the conversion of the starch into dextrin and maltose, before coagulation, interferes or prevents the formation of a finely divided curd. In his experiments above alluded to, Mr. La Wall employed cereal decoctions containing when finished 3 per cent. of starch, and produced coagulation by adding to the milk mixture, heated to 100° F., enough diluted hydrochloric acid, several drops at a time, to produce a total acidity of 0.257 per cent. When plain cows' milk, or cows' milk with an equal part of water, was so treated, a cheesy coagulum was produced, which would prove difficult of digestion even in the stomach of an adult. The same cheesy coagulum was produced if the milk was mixed with an equal part of cereal decoction in which the starch had previously been converted; but when the starch was converted in the cereal decoction after coagulation had been effected, or when the cereal decoction was made from baked cereal flour, or from arrow root, the coagulum produced was in form of fine flocculent particles which would be easily attacked by the digestive enzymes.—*Amer. Journ. Pharm.*, Nov., 1901, 561–562.

Mother's Milk—Fluctuation in the Fat Content.—Gregor calls attention to the fact that mother's milk may vary in the same individual from 2.9 to 8.8 per cent. of fat content. It is self-evident that such extraordinary variations must have marked influence on the caloric and nutrient value of the milk.—*Pharm. Centralh.*, Dec. 19, 1901, 84; from *D. Med. Wochschr.*, 1901, Lit. Beil., 283.

Humanized Cow's Milk—Preparation with Rennet.—F. Siebert prepares humanized cow's milk advantageously by the aid of a saccharated rennet, which is marketed under the name of "pequin." A small quantity of this ferment is added to 200 Gm. of sterilized milk and the container, after shaking, is placed into water at 40° C. for 5 to 10 minutes,

until it is completely coagulated. Water, cream, mucilage, egg-yolk, &c., may then be added as required, and the coagulum is then destroyed by vigorous shaking.—Pharm. Ztg., Aug. 21, 1901, 666; from Münch. Med. Wchschr., 1901, No. 29.

Milk and Butter—Analysis by the Retail Druggist.—Frederick T. Gordon, with the object of encouraging retail druggists to engage in the testing and analysis of food-stuffs, a field as yet practically untilled, enters very exhaustively into the subject of the examination of milk and butter. The necessary apparatus for this purpose do not entail much expense, and the conduct of the process and manipulation does not call for more skill than the pharmacist is called on to display in his pharmaceutical work. The details of the method may be consulted in Merck's Rep., Jan. and Feb., 1902, 3-4 and 43-45.

Kumyss—Practical Method of Manufacture.—Herman F. Ahrens communicates the following formula and process for preparing kumyss which he considers convenient and practical for the pharmacist: Into a one-gallon bottle introduce the following mixture, which will be found to be sufficient for 10 or 12 oz. suitable bottles:

Fresh cow's milk.....	80 fl. oz.
Syrup U. S.....	1 fl. oz.
Glycerin	2 fl. dr.
Water which has been boiled and cooled	40 fl. oz.
Cake yeast	5 grains.

Triturate the yeast in a mortar with a small quantity of the mixture, add this to the contents of the bottle and agitate. Transfer to regular kumyss bottles, which should not be completely filled, and immediately close them with perfectly fitting corks that have been kept in boiling water for a short time before use. Secure the corks with twine, and seal the bottles by dipping the necks into melted parafine. Place the bottles in a horizontal position and allow fermentation to proceed at a temperature ranging between 70°-80° F. for 48 hours, during which time they should be occasionally agitated. If a higher temperature is employed the fermentation will proceed too rapidly and an unsatisfactory product will result. After the fermentation is over, place the bottles on ice and allow them to remain there for at least 12 hours before dispensing. Kumyss prepared in this manner will keep for at least a week if stored on ice.—Merck's Rep., April, 1902, 149.

Artificial Foods—Liability and Causes of Deterioration.—Charles H. LaWall has communicated a timely paper in which he calls attention to the deterioration or change which is liable, and so often does, take place in artificial foods—a subject of vital importance, not only to the manufacturers of the food and to the consumer, but of equal importance also to

the purveyor and the prescriber. Little or nothing has been published relative to a matter of such widespread importance, and the fact remains that all the literature on the subject is fragmentary and confined almost exclusively to technical works with which the average pharmacist or physician is unfamiliar. In the hope that his paper will lead to a proper understanding of the principles involved and will result in instituting such precautionary measures as may be found necessary to prevent untoward changes likely to occur, the author briefly reviews the nature of the material and the changes to which it is subject. Taken collectively, the constituents of artificial foods may be divided into three classes, viz., fats, proteids, and carbohydrates. The ingredients furnishing these may be of the following: Dried milk, flours or ground cereals, sugars or dextrins, starches, desiccated eggs or meat extracts. The deterioration may be due to chemical changes—such as oxidation of fatty matter, fermentive decomposition of the carbohydrates, or putrefactive changes involving the proteid and albuminous matter—or to physical adulterations brought about in various ways—such as the absorption of odorous matter derived from the place of storage.--Amer. Journ. Pharm., Oct., 1901, 471-481.

New Blood-Protein Compound—Electric Method of Preparation.—Hofmann has introduced a new blood-protein compound which is prepared by decomposing defibrinated blood, diluted with an equal volume of water by means of an electric current under somewhat increased tension. A grey-green deposit forms on the cathode which when dried and powdered contributes the new medicament. It is almost insoluble in water and yields none of its iron content to the same: but when introduced into the organism parts with the iron, which is completely assimilated.—Pharm. Centralh., Aug. 22, 1901, 517.

Hematin—Practical Method of Preparing a Satisfactory Product.—Torald Sollmann discusses the comparative value of "inorganic" and "organic" iron preparations, and describes the preliminary experiments made which have led him to adopt and propose the following practical process for the preparation of hematin: Defibrinated beefs' blood, 1000 Cc.; pepsin, U. S. P., 1.5 Gm.; dilute hydrochloric acid, U. S. P.: test solution sodium carbonate, U. S. P.; thymol, of each a sufficient quantity. (1) To the defibrinated blood, which is blood rendered non-congealable by vigorous stirring for some ten minutes immediately after it has been drawn from the animal—add 2000 Cc. of diluted hydrochloric acid and of 0.5 Gm. of pepsin. Pour into large bottles, which should be one-fourth filled. Add to each bottle small crystal of thymol (the size of split pea), and set the bottle in a water bath (an ordinary wash-boiler), which is kept at a temperature of 40° C. for 24 to 36 hours. (2) Render the contents of the bottle just neutral to litmus by the sodium carbonate solution. Fill the bottles with cold water, and let them stand in a cool place until the precipitate has settled. (3) Carefully decant the supernatant liquid, leaving the precipitate and

adhering liquid in the bottles. Again fill the bottles with water, let settle and decant. To the washed and moist precipitate in the bottles add now enough of a mixture of 40 Cc. diluted hydrochloric acid, 0.5 Gm. of pepsin and 960 Cc. of water; to a third fill the bottle; add to each a small crystal of thymol, and digest at 40° C. for 24 hours. Then proceed as under (2). Decant a little of the clear liquid into a test-tube, and add an equal volume of soda solution (T. S. sodium carbonate? Rep.) and a drop of T. S. cupric sulphate. If this produces a pink color, repeat the treatment as under (3); but if the color is blue, then proceed as follows: (4) Decant the liquid from precipitate as completely as possible. Fill the bottle containing the moist precipitate with cold water, let settle, decant and repeat this until the washings give only a faint turbidity with acidulated T. S. silver nitrate. Then pour the precipitate into a large evaporating dish, dry it on a boiling water bath, and pulverize the product in a wedgewood mortar. The hematin so obtained is a black powder, non-hygroscopic, odorless and practically tasteless. It dissolves slowly in 1 per cent. Na_2CO_3 or in 0.2 per cent. HCl —less readily in 1 per cent. HCl —producing turbid reddish-brown solutions which give the characteristic hematin spectra. The product on analysis was found to contain 0.7 per cent. Fe, a constant which compares favorably with that of other (organic? Rep.) iron products—even pure “hemoglobin” containing but 0.4 per cent. Fe, according to Hüfner.—Amer. Journ. Pharm., June 25, 1902, 275–279.

Enzymes—Probably Derivatives of Protoplasm.—Th. Bokorny has made comprehensive studies and experiments to ascertain the possible relation of the different enzymes—zymase, maltase and invertase—to the protoplasms of bacteria, of yeast and of other low plant-forms and animals, and has ascertained that they exhibit marked identity in their behavior under the influence of light, temperature and desiccation, of alcohol, poisons and salts, etc. The character of the parallel experiments made are shown in a table. The great harmony which is shown by these experiments to exist between enzymes and protoplasms points out that the enzymes must be regarded as *active* albuminoids.

“*Protoplasmaproteins*,” eliminated from the living protoplasm, in which they are contained ready formed and in which they may be newly formed in any desired quantity. Moreover, these enzymes, or “protoplasmaproteins,” are not necessarily identically the same from the same protoplasm, which may contain a number of them differing from each other. Thus the protoplasm of yeast may possibly contain as many as a dozen “protoplasmaproteins.”—Pharm. Centralh., Oct. 31, 1901, 681–684.

Enzymes—Existence in Insoluble Form.—The results of studies and investigations recently communicated by M. W. Beijerinck confirm the existence of “urease,” the enzyme concerned in the hydrolysis of urea, and also that, in conformity with the opinion previously expressed by

Leube, this enzyme exists in an insoluble form intimately associated with the living as well as the dead urea-bacteria. Solutions of urease, such as are frequently cited as having been obtained by Murculus, are not actual solutions, but simply hold the enzyme in suspension. The existence of an absolutely insoluble enzyme was however not unexpected, since the author has previously shown that "isatase," the enzyme of *Isatis tinctoria*, concerned in the production of indoxyl, cannot be extracted from the deadened cells of the plant by any known method.—Pharm. Centralh., Oct. 31, 1901, 696; from Centralbl. f. Bakter., 1901 (II), 33–61.

Nepenthe-Enzyme—Tryptic Activity.—Prof. S. H. Vines, at a meeting of the Linnean Society, gave some account of his investigations of the proteolytic enzyme of *Nepenthes*, for which, just as the enzyme of the papaw is termed papain, and that of the pineapple bromelin, he suggests the name

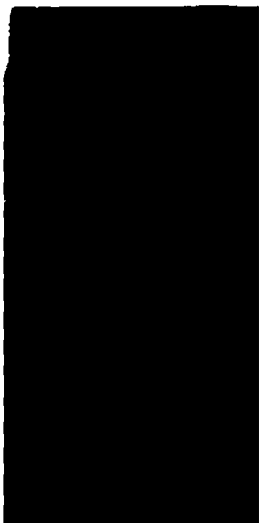
Nepenthin.—Preliminarily, he pointed out that, in the higher animals, there are two distinct proteolytic enzymes: (1) pepsin, secreted by the stomach; (2) trypsin, secreted by the pancreas. The action of pepsin upon the more complex proteids (albumin, fibrin, etc.) is to convert them by hydrolysis into simpler proteids known as peptones; whereas the action of trypsin is not only to convert these proteids into peptones, but further, to decompose the peptones into non-proteid nitrogenous substances, such as leucin, tyrosin, etc. Among these final products of tryptic digestion there is a substance termed tryptophan, which has the property of giving a pink or violet color on the addition of chlorine water. Hence this color-reaction may be used as a means of determining the nature of the digestion to which any proteid may have been submitted. As the result of previous researches upon the nature of the digestion effected by the enzyme of *nepenthe*, Professor Vines has come to the conclusion that it is not peptic, as had been supposed, but essentially tryptic. This conclusion has recently been called in question by Clautriau, who reasserts the peptic character of the enzyme. By means of the tryptophan-reaction, which is readily given by the products of a *nepenthes* digestion, Professor Vines has been able to establish the correctness of the view that the enzyme is tryptic. The tryptophan-reaction has also been found to be given by a number of extracts of plants which are known to contain a proteolytic enzyme; for instance, pineapple juice, papain, figs, germinating bean-seeds, etc. It seems probable, therefore, that proteolytic digestion in plants is always tryptic—that there is, in fact, no peptic enzyme in plants. But there is this peculiarity about the trypsin of plants, that it has to work in an acid medium.—Pharm. Journ., Dec. 7, 1901, 639.

Emulsin—Occurrence in Fungi and Lichens.—The astonishing energy with which some of the cryptogams are capable of decomposing glucosides has induced G. Hent to undertake the study of a number of fungi and

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tion sets in ; if this can be done without the temperature of the tray being raised above 100° Fahrenheit so much the better. As the substance becomes dry it shrinks considerably in bulk. The contents of several trays may now be emptied into one and the drying continued. The trays emptied are ready to receive another day's supply of fresh material. Drying must be continued until the substance is crisp, and in such a condition that it can be reduced to a fine powder without any difficulty being experienced from stickiness. The dried material should be ground to a fine powder when the resulting product should be a white or cream-colored powder with a characteristic, but not putrid smell. The powder should be packed in tins or bottles, and carefully preserved from contact with the air. Grinding is easily effected in a mill of the type commonly employed for grinding coffee ; when grinding it is desirable to have the papain slightly warmed.—Pharm. Journ., May 17, 1902, 409 ; from Agricultural News, 1, 4.

Animal Digestive Ferments—Evolution and Use in Medicine.—Benjamin T. Fairchild contributes a highly interesting paper on the evolution and use of the animal digestive ferments in medicine, in which he gives a brief, clear, and so far as possible, authentic view of the genesis of the subject as it comes to and concerns us to-day in pharmacy and medicine. Tracing this evolution from the first recognition of a vital principle in the stomach possessing fermentative action, made by Von Helmont (1587–1644), and the observation of Boretti (1608–1679) regarding the value of the gastric juice in the digestion of food and the existence of the secretory glands, followed by the observations of Reaumur, Stevens, Spallanzani and others in the eighteenth century, and of Prout, Thiedemann, Gmelin, Beaumont and others during the early years of the nineteenth century, a point is finally reached when the accumulated observations of the preceding three centuries begin to bear fruit—the successful preparation of artificial gastric juice, by Eberle in 1834, by scraping the mucus from the inner wall of the dead stomach and extracting the same with water and with dilute acids, being the first practical application, materially advancing our knowledge of digestion, and doubtless paving the way for Schwann's brilliant researches in 1836, which were so thorough and careful that almost all the observations and results hold true to-day. Schwann found that the active principle was soluble in water and feeble hydrochloric and acetic acids ; that acid was essential for its manifestations ; that free acid alone had no solvent power on coagulated albumen ; that the active principle was not in combination with acids ; that an excess of acid destroys ; that dilution does not weaken the activity if the acidity is maintained ; that the action is a "contact action."

From this time on the study of pepsin and proteolytic enzymes became more prolific. In 1839, Wasmann prepared dry amorphous pepsin by the aid of lead acetate and precipitation in the alcohol, notably also a very

potent product from the stomach of the pig. Burdach (1841) showed that acidulated infusions of many organs and tissues possessed proteolytic powers. In 1842, Blondlot in France, and Bassoro in Russia, succeeded in establishing gastric fistulæ in dogs, and in 1845 his experiments were extended by Bernard to the pancreas, who stated that the whole function of that organ is its power to emulsify fats, while Bouchardat and Sandras, in the same year, found the pancreatic juice of fowls to exhibit great diastatic power. While there exists some dispute as to priority of the discovery of the proteolytic power of the pancreas, Corvisart, in 1857, removed all doubt concerning its existence; and to him also, and to Dr. Lionel Beale, is to be credited the first suggestion of the use of "pepsin" in medicine—Dr. Beale (1858) having published a process for preparing that substance by scraping the mucous membrane of the stomach and drying the viscid fluid at a low temperature on glass. Meissner (1859 and 1860), Brucke (1859) and Danilewsky (1862) also made important contributions tending to throw further light on these ferments, the conclusions of the latter being particularly calculated to harmonize the conflicting views held concerning them. He holds that there are three distinct ferments, acting respectively on starch, fibrin and fat; that two of these ferments can be isolated in a form of comparative purity, the fat-splitting ferment being probable; that the amylolytic ferment acts in acid (?), alkaline and neutral media, the proteolytic in neutral and alkaline only; that the digestion of the coagulated fibrin is not due to putrefaction; that alkaline media are not favorable, excess of free alkali or free hydrochloric acid checking the action on fibrin. Further, that the proteolytic substance is not a pure albuminoid, but is a colloid substance. In 1867, Kuehne published his contribution on the pancreas, its ferments, etc., and since then gave the name "tryprin" to the proteolytic ferment and introduced the name "enzymes" to designate the digestive ferments, a distinction having been shown to exist between these unorganized ferments and the organized ferments or micro-organisms which Pasteur had shown to be the inciting cause of alcoholic fermentative processes. But this older theory concerning alcoholic fermentation has very recently also been shattered, since Buchner (1897) made the wonderful discovery that alcoholic fermentation of sugar is produced by an enzyme—Zymase—which can be isolated from the yeast cell.

In 1872 Scheffer published a method for preparing commercial pepsin by precipitation from an acid infusion of the stomach with common salt, for which purpose other neutral alkali salts may be used. In 1873 Ebstein and Grutzner demonstrated that pepsin does not exist as such in the stomach, but is rapidly formed from its progenitor—termed "pepsinogen" by these authors—by the gastric acid. In 1875 Heidenhain discovered a zymogen, now called "trypsinogen," in the pancreas. Since then the investigations have been so numerous that they are mainly referred to by the names of the author, the inquiries being mainly directed to attempts to

isolate the pure enzymes in the hope of ascertaining their chemical nature ; and by careful examination of the cleavage products of proteids produced by enzyme or by chemical action to throw some light upon the structures of the proteids themselves.

By far the larger part of this voluminous paper is devoted by the author to his own observations and criticisms concerning the chemistry, pharmacology, manufacture and uses of the different digestive ferments, his wide experience in the manufacture making this a noteworthy contribution to our knowledge of them. It is possible here only to call attention to salient points, as follows : The period covering the past twenty years has been one of quickened and extended interest and progress in the applied science of the digestive ferments. The animal digestive juices and ferments are now largely utilized in the technical laboratory in the production of peptonized foods in an agreeable, adequately nutritious and stable form, especially adapted as widely available foods for the sick. The dependance of pepsin upon an acid reaction, and the limitation of its action to proteids only, has restricted its use in the artificial digestion of food purely to laboratory methods, while pancreatic preparations in both dry and fluid form have come into very general use as therapeutic agents. The manufacture of pepsin has been greatly improved, and its standard of value raised to an adequate point. The milk-curdling enzyme has now become much employed in therapeutics, and the topical application of the gastric juice—in form of artificial gastric juice prepared direct from the fresh stomach—has been brought to renewed attention as a bactericide, deodorant and solvent, while “trypsin” is employed as a solvent in the treatment of pus-cases, etc. The proteolytic enzymes have been shown not to exist pre-formed in the secreting cell—they may be said to exist as “zymogens.” Whether “zymogens” of the starch-converting and milk-curdling and emulsifying ferments also exist, is not certain. In the author's opinion this has been established only for the proteolytic enzymes. In their chemical constitution, the enzymes are presumably identical, being proteid, or closely akin to proteid in their nature and behavior. They are all soluble, destroyed when in solution by heat, but resistant to high temperature (100° C.) when in dry form, and, with probably one or two exceptions, they are non-diffusible. The gastric juice is generally held to contain two distinct enzymes, one possessing proteolytic, the other milk-curdling action—the latter being particularly a constituent of the nursing animal and diminishing in direct ratio to the growth of the animal. The enzyme becomes potential or vitilized only at the moment of its discharge or extrusion from the cell. Pepsinogen is not bound up with an acid, but there is a strong chemical and physiological tie between them. The hydrochloric acid of the gastric juice we know does not exist as free acid, but is in some way bound up to the proteids, this acid again uniting with the proteids and bases of foods and displacing organic acids. With regard

to the technical production of pepsin and its preparations the author observes that Scheffer's process and Scheffer's pepsin may be characterized as marking an epoch in the production of pepsin by a method admirably adapted to commerce. It had the great merit of employing reagents innocent in themselves and strongly antiseptic, and this is especially advantageous from the fact that the precipitate or magma which is collected is so strongly impregnated with the salt used for the precipitation that either in the moist or pressed form it retains its properties under the ordinary conditions of manufacture, without decomposition, until reduced to dryness. By re-solution, clarification and re-precipitation, the product could be purified to a considerable degree from the precipitant and associated proteids and salts of the gastric infusion, and a "purified pepsin" was thus obtained, which was however intended for the preparation of saccharated pepsin, or more dilute forms; the "purified pepsin" being believed by Scheffer to be too strong for direct internal exhibition, and possibly productive of undesirable results. It is now well recognized that the pepsin preparations of those earlier days were too weak, containing only a grain of the saccharated to one or two teaspoonfuls, and capable of digesting only 12 to 15 grains of coagulated albumen, while modern liquid pepsin preparations, are now supplied and used, of which one teaspoonful upon U. S. P. assay will digest 2000 to 3000 grains. About ten years subsequent to the introduction of Scheffer's process, a method was patented by Jensen, which was based upon the known fact that the stomach was capable of self-digestion, and thus the tissue of the whole mucous membrane converted into a soluble form. The dried product consisted of the ferment in association with the peptones produced by the reaction—the latter possessing no digestive action, though such was at one time attributed to them. At present, taking advantage of this self-digestion of the stomach and consequent conversion of the proteids and albumoses into peptone, which is not precipitable by salt, the process employed is briefly this: infusion of the stomach by such methods as to obtain the ferment in solution as free as possible from associated proteids, precipitation of the enzyme from this solution by such well-known reagents as sodium chloride, sodium sulphate, magnesium sulphate, &c., and purification by various methods—dialysis, &c.

The pancreas gland contains four distinct ferments. Its "proteolytic enzyme" is probably not elaborated in an active form, but becomes endowed with vitality by contact of the pancreas juice with the acids of the chyme, which are undoubtedly organic in a very considerable degree, and are known to be powerful developers of the latent energy or vitality of the pancreas "trypsinogen." The "diastasic ferment" undoubtedly exists in the pancreas ready formed. The "fat-digesting ferment" varies greatly in the glands of different animals, and its action upon fat in reducing fat globules to a minute form is difficult to account for. The "milk-curdling

ferment" of the pancreas appears to be in every way analogous in its action to that of rennet, but, owing to its association with the other ferments and difficulty of separating them from it, its comparative study is at present impracticable. Contrary to the prevailing opinion that the pancreatic juice is an alkaline fluid, the fresh gland and infusions freshly prepared from it invariably give an acid reaction. Furthermore, it is found that the pancreas ferments are more readily destroyed in their alkaline solutions than is pepsin in free acid. During the earlier periods no progress in the utilization of the pancreas ferments at all comparable to that in pepsin had been made. "Pancreatin" seems to have been made by methods almost identical with the "salt process" for pepsin, notwithstanding that Sheffer had proved sodium chloride incapable of precipitating pancreatin. The latter was officially recognized in the U. S. P. in 1890, and about this time (some time before? Rep.) the National Formulary recognized it with a method of manufacture (precipitation of pancreas infusions by alcohol! Rep.), and adopted a standard as to its proteolytic power, especially relating to its practical use in the peptonization of milk the word "peptonized," it may be here mentioned, having been brought into use by Roberts, in his Lumleian Lectures of 1880, in which he demonstrated the adaptability and potency of the pancreas ferments for the peptonization of foods for the sick, and suggested methods for preparing pharmaceutical preparations of them.

Coming to the practical side of the enzymogn subject, the author observes that when we seek to utilize the proteolytic ferments of pancreas, the glands are best preserved at the ordinary room temperature, according to season, for a sufficient length of time to develop the ferment, taking care to maintain aseptic conditions; but if the starch-converting ferment is devised the pancreas gland may be put immediately into operation. That the ferments combined in solution are antagonistic to each other has often been pointed out. Scheffer early called attention to the incompatibility of pepsin and pancreatin, and pepsin and diastase in elixirs. But while it is impossible to exhibit them together in permanent solution, they may be administered together with advantage in extemporaneous mixtures. Errors concerning the nature, behavior, and relations of the enzyme, have in point of fact led to the preparation of many incompatible compounds, and have operated greatly to retard their utilization and the wide clinical investigation which would fully make known their therapeutic possibilities. In order to preserve the enzymes in solution, some antiseptic must be employed, and for this purpose alcohol and glycerin prove the most desirable for their pharmaceutical preparations. It is true, that both have certain drawbacks, but when properly diluted in the stomach the fermentative action of preparations of enzymes containing these antiseptics is neither retarded nor diminished. All these digestive ferments appear to retain their activity in acid media—observing that the free acid is not present in

undue proportion. On the other hand, pepsin solutions which have been recommended by some authorities to be prepared by neutralizing the acid infusion, are injured if the neutralization is carried to the faintest alkalinity, and this occurs instantly, and at ordinary temperature; the pepsin cannot be considered "modified" or "altered" pepsin in any sense; it is simply annihilated; its activity cannot be restored by acidification or by any treatment. Finally, it may be mentioned that the author considers it evident that we can deal with the enzymes in pharmacy and medicine with as much practical certainty as with drugs and chemicals. It is true that we do not know what pepsin is; but we know how to extract these enzymes and preserve them, and how to apply them in many important directions; know their compatibilities and incompatibilities; and we are also able to distinguish differences between simple solutions of the ferments and the secretions of the glands themselves. The paper is concluded with a lengthy biography, chronologically arranged, for 1752 to 1901.—*Amer. Journ. Pharm.*, Feb. and Mar., 1902, — and 105-120.

Pepsin—Effect of Alcohol in Solutions.—Eugene Thibault finds that alcohol even when present in very small quantity, destroys, in time, the activity of pepsin, and that therefore weak alcoholic media are quite unsuitable vehicles for pharmaceutical preparations of the ferment. A solution of pepsin in a medium containing 11 per cent. of absolute alcohol, although found to retain its proteolytic action unimpaired the day after making, had lost 40 per cent. of its activity in two months, and was totally inactive in about four months. With slightly stronger alcoholic solutions containing respectively 14.7 and 29.3 per cent. of absolute alcohol the deterioration was markedly more rapid, the liquid, in the case of the strongest alcoholic solution, being inert the day after making. Although some brands of pepsin seem to be more resistant to the action of alcohol than others, all show marked diminution of their peptic activity after prolonged contact with weak alcohol. These results do not accord with the observations of Chassaing, who has recorded that solutions of pepsin were unaffected by contact for six months with alcohol 20 per cent., but the author points out that Chassaing employed saturated solutions of pepsin, such as are not met with in practice, and which were twenty times stronger than the elixir of pepsin of the Codex. It is found that in wines or elixirs, containing sugar and other foreign matter, this deterioration is less rapid than in the case of simple alcoholic solutions, but that it nevertheless takes place to a considerable degree.—*Pharm. Journ.*, April 12, 1902, 294; from *Journ. Pharm. Chim.* [6], 15, 161.

Pepsin—Action of Alcohol.—The investigations of Eug. Thibault confirms in many respects the observations that have frequently been made in the past that the digestive power of pepsin is greatly retarded by the presence of alcohol even in small percentage and completely destroyed under the action of certain large percentages. In the presence of alcohol, in the

form of wine containing 10 per cent., the pepsin appears to retain a certain effectiveness during several months, but then diminishes rapidly and is completely destroyed. In the presence of larger percentages of alcohol, the pepsin loses its activity in a corresponding degree both as regards the absolute effectiveness and its final destruction, and if as much as 30 per cent. is contained in the preparation its destruction is immediate.—Pharm. Ztg., Mar. 8, 1902, 188; from Journ. de Pharm., 1902, No. 4.

Pancreatic Ferments—Characters of Distinction.—The investigations of Dr. H. M. Vernon on the nature of various pancreatic ferments show that the *tryptic ferment* is an extremely unstable body, since from 70 to 80 per cent. of the amount present in a very active extract of the pancreas may be destroyed in an hour by 0.4 per cent. of sodium carbonate at 38° C. The activity of such extracts also deteriorates gradually on keeping for weeks, but the trypsin remaining is more and more stable with the lapse of time, the last portion being from ten to twenty times more stable than the first. It would appear, therefore, that the trypsin ferment is not a single substance, but that there may exist series of trypsins of varying degrees of stability. There are also series of *rennins*, but not of diastase, that the *diastasic ferments* of the pancreas, of saliva, and of malt, differ from each other considerably in their hydrolyzing action on starch. The *rennet ferment* was found to have a zymogen very similar to that of the tryptic ferment, whilst the zymogen of the diastasic ferment is an insoluble body. In the conversion of the tryptic zymogen into enzyme the most energetic agent was found to be the enzyme itself, the addition of 1 per cent. of an active extract to a solution of zymogen at 38°, sufficing to convert one-third of the zymogen into enzyme in an hour. Curiously enough the tryptic ferment can also liberate the rennet ferment from its zymogen, though the rennet ferment fails to produce the same effect.—Pharm. Journ., May 13, 1902, 1459; from Nature, 66, 719.

Erepsin—A Peculiar Intestinal Ferment.—Otto Cohnheim states that the intestinal mucous membrane secretes a peculiar ferment, which transforms proteoses and peptones into soluble bodies, which are not proteoses, since they do not give the biuret reaction; they are not coagulated by heat, but are precipitated by phosphomolybdic acid. That this change is not due to the vital action of the mucous membrane is itself shown by the fact that the same result is obtained with filtered macerations of the membrane; it is, in fact, brought about by a soluble diastase secreted by the intestinal tissue. Although trypsin is present in the intestinal secretions, the results obtained are not due to that ferment, but to a new body, erepsin: trypsin will peptonize fibrin, but erepsin, although very active on proteoses and peptones, is without action on fibrin. The conclusions of Neumeister that the intestinal mucous membrane acts on the peptones in the same manner as it behaves towards fatty bodies, bringing about the formation of synthetic products is contradicted, since, if this were the

case, the products would give the biuret reaction, which is not so. The whole of the peptone originally present may be precipitated by phosphomolybdic acid, in the form of a crystalline compound.—Pharm. Journ., April 5, 1902, 273; from Zeits. für Physiolog. Chem., through L'Union Pharm., 43, 55.

Adrenalin—Preparation and Characters.—At the pharmaceutical meeting of the Philadelphia College of Pharmacy, in October, 1901, Dr. Jokichi Takamine exhibited some pure adrenalin, in crystals, and read a paper in which, after reviewing the historical facts connected with the therapeutic value and uses of the suprarenal gland, he describes the method of preparing its active principle and the character of the same. The preparation of adrenalin is quite simple and may be outlined as follows: Finely disintegrated suprarenal capsules are steeped in water or acidulated water for almost five hours at a temperature varying from 50° to 80° C., with frequent agitation and with addition of water as it evaporates, after which the temperature is raised from 90° to 95° C. for one hour so as to coagulate as much albuminoid as possible—the surface of the liquid being covered by a layer of fat in order to prevent the absorption of oxygen by the active principle of the gland. The mass having been expressed, the liquid is set aside and the residue of expression again steeped for several hours in warm water acidulated with acetic or hydrochloric acid, in order to extract the residual active principle, and expressed as before. After separating the oil from the mixed liquids, these are evaporated to a suitable strength in a vacuum pan, and the clear extract is treated with about two or three times its volume of ethyl or methyl alcohol, either of which will precipitate inert organic and inorganic substances. The alcoholic solution of crude adrenalin so obtained is now concentrated in a vacuum still, when, on addition of ammonia to the residual liquid, to distinct alkaline reaction, impure adrenalin will separate after several hours in form of a yellow-brownish precipitate, which is washed with water and dried. The purification of the crude substance is accomplished by dissolving it in acid and alcohol, then adding ether which causes a precipitate consisting chiefly of coloring matter and inorganic impurities. These being separated by decantation and filtration, and the alcohol and ether removed by vacuum distillation, the adrenalin is obtained as a white crystalline precipitate on

ble in acids and in alkaline hydroxides. The salts of adrenalin—hydrochloride, sulphate, benzoate—are very soluble, but have not been obtained in a crystalline condition. Ultimate analysis points to $C_{10}H_{15}NO_3$ as being the empirical formula for the base.—Amer. Jour. Pharm., Nov., 1901, 523-531.

Antitoxins—Remedial Value.—A highly interesting address on the nature and remedial effects of the anti-toxins was delivered by Dr. C. B. Lowe at the meeting of the Pennsylvania Pharmaceutical Association, which very concisely portrays the advance that has been made and the beneficent results that have been obtained from their use since their introduction for the treatment of disease. Of these anti-toxins, the most valuable by far up to this time has been the diphtheria anti-toxin. So remarkable have been the results achieved by its use, that this disease which was formerly looked upon as a most dreadful one, that in the majority of cases would prove fatal, has now lost to a large extent its terrors. Figures, however, are more eloquent than words. The American Pediatric Society reported in 1897 that the percentage of recoveries in laryngeal diphtheria (the most severe type) is now 73 per cent., against 27 per cent. formerly. The official report of the Board of Health of Baltimore gives the following statistics :

In 1894, without anti-toxin, per cent. of death.....	74.15.
In 1895, without anti-toxin, per cent. of death.....	71.42.
In 1896, without anti-toxin, per cent. of death.....	51.87.
In 1897, first year of the use of anti-toxin	23.27.
In 1898, with the use of anti-toxin	5.73.
In 1899, with the use of anti-toxin	4.61.

The next most valuable treatment is probably that for hydrophobia. At the Pasteur Institute, Paris, where the treatment was first introduced, the mortality arising from the bite of rabid animals has been reduced to about 0.25 per cent. At the Pasteur Institute, N. Y., 424 were treated, two deaths resulting. In the case of tetanus, the period of incubation is so short that there is not time to produce immunity. It should, however, be tried in all cases where there is a probability of its occurring, and in sub-acute cases will no doubt be efficient. With regard to the other anti-toxins or serums, these are still on trial, opinions as to their value being somewhat discordant, and yet on the whole favorable.—Proc. Pa. Pharm. Assoc., 1901, 143-147.

Cytotoxins—A New Class of Serums.—Cytotoxins is the generic name given to a series of poisonous substances obtainable under prescribed conditions from different human and animal organs and fluids, the following being known according to Metschnikoff:

Hepotoxin, from the liver ;

Nephrotoxin, from the kidneys ;

Trichotoxin, from the epithelial hairs ;
Hæmotoxin, from defibrinated blood ;
Leucotoxin, from the lymphatic ganglia ;
Spermatoxin, from the spermazoids ; and
Neurotoxin, from the nerve substance.

These toxins are obtained by injecting an emulsion of the particular organs of one kind of animal into another animal, the serum of which then proves to be highly poisonous to the original kind of animal. So far Metschnikoff has made experiments with *hæmotoxin*, which point out, in the main, its possible utility in the treatment of anæmia. Injection of the toxin primarily effects a reduction of the red blood corpuscles and of hæmoglobin, but afterwards produces a decided augmentation of the same.—Pharm. Centralh., July 4, 1901, 420 ; from Ztschr. d. Allg. Apoth. Ver., 1901, 523.

"Sérum Antivenimeux"—*A Successful Antidote to Snake Bites*.—An interesting account of the method practiced by the director of the Pasteur Institute in Lille, Dr. Calmette, for obtaining the venom of serpents and preparing an antitoxin from it, is given in "Umschau." Dr. Calmette grasps the head of the serpent (the Indian cobra) by means of long pinchers, and then, with the left hand, the neck of the animal, in such manner that it is deprived of all support. An assistant then presses a large watch glass between the jaws, pressing upon the upper jaw so that the venom may be caused to exude into the glass. When this operation is finished, the serpent is fed through a funnel inserted between the jaws, the food consisting of raw eggs, which thus pass direct into the stomach ; these operations being repeated every 2 or 3 weeks. The collected venom is at once dried in a vacuum, dissolved in a 7 pro mille solution of sodium chloride, and from this further dilutions are made, containing accurately calculated percentages of the dried venom ; and with these the antivenum serum is obtained from horses rendered immune to the poison in a manner similar, if not identical, with that practiced in the preparation of diphtheria antitoxin. By drying the serum, Calmette obtains also an active substance which is known as "antivénene." The efficiency of this antidote has passed the stage of experiment and is beyond dispute. Indeed, Dr. Calmette himself had occasion to use it in his own person ; having been bitten by a cobra, he recovered without inconvenience after applying this antidote, which now is largely exported to the tropics.—Pharm. Ztg., Feb. 15, 1902, 131.

URINARY COMPOUNDS, ETC.

Urine—Preservatives.—Varges recommends chinosol and mercuric oxycyanide as being the best preservatives of urine, using 1 Gm. of the first or 0.1 Gm. of the oxycyanide to 1500 Gm. of the urine. Next to these he

recommends the addition of 10 Cc. of chloroform to the 1500 Gm. of the urine. O. Schweissinger observes, in referring to this recommendation, that he has found thymol to answer admirably as a preservative of urine, a crystal the size of a pin's head added to 100 Cc. of urine sufficing to preserve it for several years.—Pharm. Centralh., Feb. 6, 1902, 75 and Feb. 27, 1902, 117.

Urine—Reactions After the Administration of Sandal Oil.—W. Karo finds that the urine drawn after the administration of sandal oil, in contrast with that drawn after the administration of copaiba, gives no color reaction on addition of mineral acids, nor shows any characteristic absorption bands in the spectroscope. It contains, however, more resin acids, precipitable by concentrated hydrochloric acid, than does copaiba-urine, the quantity being proportional to that of the absorbed sandal oil. The sandal-urine furthermore possesses considerable reducing power, due to glycuronic acids, which are probably combined with the sesquiterpenes of the sandal oil. These several reactions disappear, however, within 12 to 15 hours after the administration of the oil.—Pharm. Ztg., Sept. 7, 1901, 715; from Arch. Experim. Pathol., through Chem. Ztg. Rep., 1901, No. 28.

Urine—Determination of Alkaloids.—H. Guillemard finds silico-tungstic acid a useful reagent for the determination of the alkaloids in urine. If a 5 per cent. aqueous solution of this acid is added to normal urine which has been freed from albuminoids and mixed with 3 per cent. of hydrochloric acid, a dense, voluminous precipitate is produced which separates readily. This precipitate, after washing carefully with 3 per cent. hydrochloric acid and drying by the aid of the air-pump, constitutes an amorphous rose colored powder, from which the alkaloids are easily separable by weak alkalies. It contains the silico-tungstates of kreatinine, the xanthine bases, an alkaloidal pigment forming amorphous yellow grains, an uncrystallizable substance apparently constituting the non-dialyzable basic component of urine, and finally, a substance volatilizing with a urinary odor at 80° C. and capable of forming a soluble crystalline chloroplatinate.—Pharm. Ztg. July 10, 1901, 554; from Chem. Ztg., 1901, No. 51.

Urea Hydrochloride—Preparation from Phenylhydrazine.—After various unsuccessful experiments, P. Cazeneuve has succeeded in preparing the hydrochloride from a sample of urea which had been made from phenylhydrazine (diphenylcarbazine), as follows: Five Gm. of the urea are dissolved in 60 to 80 Cc. of hot alcohol at 93°. Into this alcoholic solution, when nearly cold, a large excess of anhydrous ether saturated with hydrochloric acid gas is poured. Gradually the hydrochloride of urea crystallizes out in small crystals having the appearance of cauliflowers. This body is white and insoluble in water or ether, but soluble in hot alcohol. It deteriorates in boiling water. It is not decomposed *in vacuo* over

soda-lime, and melts with decomposition at 125°; with hydrochloric acid, carried out with a titrated substance dried *in vacuo*, gave the following results: 1 Grm. ; HCl = 0.07738 Grm., or 12.97 per cent; mono-hydrochloride requires 12.94 per cent; yields the mono-hydrochloric compound.—*Cl* 165; from Bull. Soc. Chim. de Paris (3), xxv,

Urine—Sugar Determination by Fermentation

that the most simple, satisfactory and conclusive method for the determination of sugar in urine is that by fermentation, and that it is so because of the ease with which yeast can be compressed in form. He calls attention, however, to the precautions which have to be observed in order to insure accuracy in its quantitative determination by fermentation with yeast.

(1) Note the change in specific gravity of the sample before and after fermentation. (2) Distill the fermented sample and determine the specific gravity of the alcohol it contains by the specific gravity of the sample.

(3) Collect and measure the carbon dioxide evolved from the sample. The carbon dioxide gravimetrically in the ordinary way, which commends itself for ordinary practical analysis is the third, and this is the only one considered.

He points out that carbon dioxide being soluble in water, the content of an equal volume at the ordinary temperature must be brought into calculation when this method is used.

This might be accomplished by saturating the sample with carbon dioxide from some extraneous source, but this is not recommended.

Under circumstances, the amount of sugar may be determined from the amount of carbon dioxide produced is completely dissolved in the sample.

In such cases a known quantity of sugar is added, and the carbon dioxide produced from it deducted from the total carbon dioxide produced from the sample.

For the detailed description of the precautionary methods the original paper in Pharm. Rev., March, 1902, 104-108.

Urine—Modification of the Copper Test for Sugar

observes that as a test for traces of sugar in urine the copper test is universally admitted to be unsatisfactory. While a small amount of glucose in simple aqueous solution, it gives a satisfactory evidence of the presence of glucose in urine.

that proportion. The copper is reduced, indeed, but the copper is not immediately deposited, and is sure to be mixed with other compounds which more or less disguise its identity.

has taken place can however be proven in a very simple manner by the presence or absence of glucose in the sample.

depends upon the fact that in the presence of cuprous oxide, iodine throws down a heavy precipitate of cuprous iodide. The test is carried out as follows: Put into a test tube two or three drops of Fehling's Solution with about 30 minims of distilled water. Heat to boiling, then add from a pipette five drops of the urine. Boil the mixture one minute. If a red precipitate occurs, which is likely if the urine contains as much as 1 grain of sugar in the fluid ounce, the test is ended. If not, neutralize the liquid cautiously with hydrochloric acid, adding a slight excess; then add a few drops of a solution of potassium iodide. If this produces more than a faint cloudiness, sugar is probably present. If a heavy white precipitate is produced, sugar is present in considerable quantity. In the latter event, the experiment is repeated, using a single drop of urine. A distinct cloudiness will be produced if there is present as much as one grain of sugar to the fluid ounce. If a heavy precipitate again falls, dilute the urine until a single drop produces only a semi-opacity of the fluid on addition of the potassium iodide. From the degree of dilution an approximate estimation may be made of the quantity of sugar present. In the absence of these evidences of the presence of sugar no other test is necessary; but if the reactions are obtained as explained, it is well to confirm the results by other tests for sugar, the phenylhydrazine or the picric acid test being recommended by the author for the purpose, preference being given by him to the latter over all others.—Pharm. Rev., Dec., 1901, 531-533.

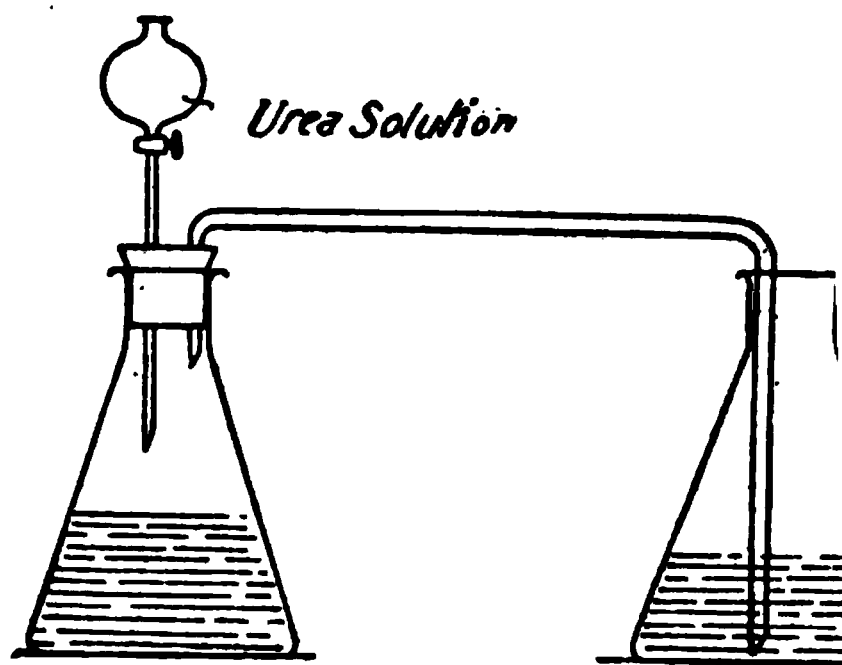
Urine—Estimation of Very Small Quantities of Sugar.—Emil Raimann finds that other bodies besides sugar will be precipitated when phenylhydrazine is added to urine. Hence he corrects the weight of precipitate obtained in direct precipitation by subtracting the weight obtained from an equal volume of the urine which has previously been submitted to fermentation.—Pharm. Rev., Sept., 1901, 409; from Ztschr. f. Anal. Chem., 40, 390.

Urine.—Experiments concerning the availability of a colorimetric form of the phenylhydrazine test for *glucose*, which see under "carbohydrates."

Urea—Quantitative Estimation by Means of Calcium Hypochlorite.—Dr. Walther Braeutigam recommends a method for the quantitative estimation of urea, which depends upon the decomposition of the latter in the presence of calcium hypochlorite into carbon dioxide, nitrogen and water—the reaction occurring according to the following equation: $\text{CO}(\text{NH}_2)_2 + 3\text{CaOCl}_2 = \text{CO}_2 + \text{N}_2 + 2\text{H}_2\text{O} + 3\text{CaCl}_2$. If then a sufficient excess of calcium hypochlorite is present, this is decomposed with formation of calcium carbonate and calcium chloride, according to the equation: $2\text{CaOCl}_2 + \text{CO}_2 + \text{H}_2\text{O} = \text{CaCO}_3 + \text{CaCl}_2 + 2\text{HClO}$. Consequently one molecule of calcium carbonate is formed from each molecule of urea—the respective molecular value being as 10 to 6. The process is

carried out conveniently in the simple apparatus (two Erlenmeyer flasks of 250 Cc. capacity. One with a bi-perforated stopper having a stoppered funnel bent twice at right angles and reaching to near the flask. Reaction at once begins energetically, the gas goes into the second flask, containing 100 Cc. of hypochlorite. The carbonic dioxide is absorbed, while the other gas escapes. When all the urea solution has been added, the first flask is inverted to cause the complete expulsion of the carbonic dioxide.

FIG. 54.



Carbonate produced in the second flask, is carefully collected on the tared filter, and weighed. Ten parts so found are equivalent to six parts of urea. The author has experimentally shown that the presence of uric acid, of kreatinin or of allantoin does not interfere with the accuracy of the method, because they are present in small proportions and are very slowly attacked by hypochlorite while urea is attacked instantaneously. If urea is to be determined in urine, it is necessary to make preliminary tests for the presence of—glucose—which is attacked with avidity by the hypochlorite—albumin—which is attacked more sluggishly. Both of them, if present, must be removed before determining the urea: the glucose, by solution in water and fermentation with compressed yeast; the albumin, by the addition of drops of acetic acid to the filtrate and heating it on a water-bath until the albumen is completely coagulated. Furthermore, the filtrate must be neutralized, carbonates, phosphates and sulphates removed by adding a mixture of barium nitrate and sulphuric acid in saturated solution, and subsequent filtration.—Pharmaz. Zentralbl., 1901, 907-908.

Uric Acid—Delicate Reaction.—Dr. E. Riegler calls attention to a sensitive reaction of phosphomolybdic acid with uric acid. To 5 Cc. of the fluid under examination, a modicum of

acid is added, followed, after shaking, by 10 to 15 drops of concentrated solution of sodium hydroxide. In the presence of uric acid or urate the fluid immediately assumes an intensely blue color. The reaction is available in the presence of 1 Gm. of uric acid in 100 liters of water. The same reaction is however given in the presence of quassin, of alloxan and of alloxantin.—Pharm. Centralh., Dec. 12, 1901, 787; from Wien. Med. Blätt., 1901, 789.

Uric Acid—Advantageous Method of Determination.—H. Boulet recommends the following method for the determination of uric acid, which has the advantage of not being affected by the presence of other organic compounds which interfere with the processes usually employed. A standard solution of iodic acid is prepared by dissolving 1 Gm. in 100 Cc. of distilled water; to 10 Cc. of this solution 10 Cc. of 10 per cent. HCl is added, with 30 Cc. of 10 per cent. KI solution and 200 Cc. of water. The iodine set free is then titrated with $\frac{N}{10}$ thiosulphate solution and the titre noted. One hundred Cc. of urine is taken, neutralized with soda, and precipitated with excess of barium chloride; then acidulated with 5 Cc. of 1 per cent. acetic acid, allowed to stand for fifteen to twenty minutes, and the precipitate collected, washed, and transferred to a porcelain capsule by washing through with a jet of water until 100 to 150 Cc. of liquid is obtained. To this is then added 20 Cc. of 10 per cent. H_2SO_4 solution to liberate the uric acid, and the whole is boiled. When boiling 10 Cc. of the standard iodic acid solution is added and brisk ebullition continued until all the color of iodine has been dissipated, the last traces being got rid of, at the end of the reaction, by dropping in a particle of marble; the CO_2 thus set free washes out the last trace of free iodine. On cooling, the amount of undecomposed iodic acid is determined by adding to the cold liquid 10 Cc. of 10 per cent. HCl, 30 Cc. of 10 per cent. KI solution, when the free iodine is titrated in the usual manner with $\frac{N}{10}$ thiosulphate. The difference in Cc. of thiosulphate thus used and that used in the first blank experiment $\times 0.007$ gives the amount of uric acid in the quantity of urine taken.—Pharm. Journ., Aug. 24, 1901, 273; from Bull. Soc. Chim., 25, 251.

Bile—Important Solvent Properties.—According to B. Moore and W. H. Parker, bile acts as a powerful solvent of lecithin, a feeble one of cholesterin. In the intestines it acts as a solvent for both free fatty acids and soaps, conferring their entire solubility on the former, and largely increasing the solubility of the latter. These solvent properties are chiefly due to the bile salts, though the simultaneous presence of lecithin increases the solubility of the fatty acids and soaps.—Pharm. Journ., Aug. 31, 1901, 293; from Proc. Roy. Soc., 68.

APPENDIX.

ALPHABETICAL LIST OF NAMES OF MEMBERS FROM
WHICH CERTIFICATES HAVE BEEN RECEIVED BY THE TREASURER FOR ANNUAL
CERTIFICATES, FROM JULY 1, 1901, TO JULY 1, 1902

	Annual Dues.	Certificates.	
Abbott, William A.....'01	\$5 00	\$7 50	Amount brought forward
Adamick, Gustave H. ....'02	5 00		Blakeley, George C.
Aimar, Charles P.....'02	5 00		Blakely, Collins
Allen, E. Floyd.....'01-'02	10 00		Elanding, William C.
Alexander, Charles E.....'00-'01	10 00		Blank, Alois
Allison, William O.....'02	5 00		Blumauer, Louis...
Alpers, William C. ....'01	5 00		Bobbitt, James H. .
Alpers, William H.....'01	5 00		Boeddiker, Otto
Amerling, Frank H.....'01	5 00		Boehm, Solomon ...
Amend, Bernard G .....'02	5 00		Boerner, Emil L ...
Anderson, Samuel .....'01	5 00		Bohmanson, Robt.
Anderson, William C.....'02	5 00		Bond, John B.
Andriessen, Hugo .....'02	5 00		Borell, Henry A....
Anewalt, Ellsworth R....'01-'02	10 00		Bowen, Cyrus W....
Appleton, William R .....'01	5 00		Boyd, Charles N ...
Arbery, Lorimer.....'02	5 00		Boyden, Edward C. .
Arnett, William N .....'01-'02	10 00		Boynton, Herschell..
Aughinbaugh, David C... '01-'02	10 00		Brack, Charles E....
Averill, William H.....'01-'02	10 00		Bradley, Theodore J.
Axness, Ole M.....'02	5 00		Brecht, Frederick A.
Bailey, Frederick.....'02	5 00		Breunert, August....
Baird, Julian W.....'02	5 00		Brickman, Arthur O.
Baker, Edwin .....'02	5 00		Brigham, Lawrence S.
Baker, T. Roberts.....'02	5 00		Brisley, Harry
Ball, Charles E.....'01	5 00		Broe, James A.....
Ballagh, Wilfred T.....'01-'02	10 00	7 50	Brookes, Virginia C.
Balscr, Gustavus.....'02	5 00		Brooks, George W...
Bamford, Melvin W '01	5 00		Brown, Albert E....
Barbat, Josephine E. ....'01	5 00		Brown, William T. .
Bard, William E. ....'01-'02	10 00		Brundage, Albert H. .
Bartells, George C. ....'01	5 00		Burg, John D.
Barth, George F. ....'99-'00	10 00		Burgheim, Jacob.....
Barth, Henry H.....'01	5 00		Burnham, Alfred A. .
Bartley, Elias H.....'02	5 00		Burns, Edwin M.
Bartmer, Adolph H.....'01	5 00		Burrough, Horace, Jr.
Base, Daniel '02	5 00		Butler, Charles H. ...
Bassett, Charles H.....'01	5 00		Butler, Freeman H...
Batt, Bruno '01	5 00		Byers, Huizinga C. ...
Baur, Jacob '02	5 00		Byrne, John
Baylis, Lewis F ... '01-'02	10 00		Campbell, George D. .
Bayly, Charles A.....'01	5 00		Capper, William E....
Beardmore, William A. ... '01-'02	10 00		Carpenter, Alfred B...
Beck, John G. ....'01	5 00		Carlsake, George M. .
Behrens, Emil C. L.....'02	5 00		Carter, Frank H.
Beitenman, William W '01	5 00		Case, Edmund W.....
Bell, Emil R '02	5 00		Case, Charles H.
Benfield, Charles W. ....'02	5 00		Caspari, Charles, Jr. .
Benton, Wilber M. ....'02	5 00		Caspari, William, Jr. .
Beringer, George M '02	5 00		Casper, Thomas J.
Berryhill, Henry P,.....'01-'02	10 00		Cassaday, O. U.
Berryman, William E..... '01	5 00		Chandler, Charles F. ...
Betzler, Jacob.....'01	5 00		Cheatham, Thomas A. .
Beyschlag, Charles '02	5 00		Chelf, T. Wilbur
Bigelow, Clarence O..... '02	5 00		Chesnutt, James H ...
Billings, Henry M. ....'02	5 00		Church, Merton E.....
Bingham, Charles C.....'01	5 00		Clafin, Walter A.....
Blakie, William '02	5 00		Clark, John A.....
Blake, James E '02	5 00		Claus, Otto F.
Amount carried forward	\$350 00	\$15 00	Amount carried forward

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	\$700 00	\$22 50	Amount brought forward	\$1160 00	\$30 00
Cliffe, William L. ....'01	5 00		Einstein, Morris.....'01	5 00	
Cobb, Ralph L.....'02	5 00		Elbrecht, Oscar H.....'01	5 00	
Coblentz, Virgil.....'01	5 00		Emanuel, Louis.....'02	5 00	
Cole, Victor L.....'01	5 00		England, Joseph W.....'01	5 00	
Collins, Albert B.....'02	5 00		Englander, Samuel.....'01	5 00	
Cone, Earl H.....'01	5 00		Ernst, Frank F.....'99-'00-'01	15 00	
Cone, John W.....'01-'02	10 00		Eschman, F. W. R.....'99-'00	10 00	
Conrad, John.....'99	5 00		Esters von Krakau, W. ....'01	5 00	
Cook, E. Fullerton.....'01	5 00		Eitel, John L. ....'01-'02	10 00	
Cook, Thomas P.....'02	5 00		Euler, Frederick C.....'01	5 00	
Cornell, Edward A.....'01	5 00		Evans, Joseph S.....'01-'02	10 00	
Corning, Albion J.....'02	5 00		Eyasell, George.....'02	5 00	
Cowan, John.....'01	5 00		Faber, Walter E.....'02	5 00	
Craig, William P.....'01	5 00		Fairchild, Samuel W.....'02	5 00	
Cramer, Max.....'02	5 00		Falk, John C.....'01	5 00	
Crampton, Ferd L.....'02	5 00		Farrer, Samnel R.....'99-'00	10 00	
Crane, Frank T.....'99-'00-'01	15 00		Federmann, Wm. M.....'01-'02	10 00	
Crecelius, Charles E.....'01	5 00		Feick, Charles.....'01	5 00	
Crowdle, John E.....'01	5 00		Feidt, George D.....'02	5 00	
Crum, John D.....'99	5 00		Fieber, Gustavus A.....'02	5 00	
Culbreth, David M. R.....'01	5 00		Field, Claud.....'00-'01-'02	15 00	
Curry, David W.....'01-'02	10 00		Finch, Charles S.....'01	5 00	
Curry, Gordon L.....'02	5 00		Fink, Frederick Wm.....'01	5 00	
Dadd, Robert M.....'02	5 00		Finlay, Alexander K. ....'98-'99	10 00	
Daggett, V. Chapin.....'01-'02	10 00		Firmin, John C. ....'01-'02	10 00	
Dare, Charles F.....'00-'01	10 00		Fischer, Henry.....'01	5 00	
Davis, Charles L.....'02	5 00		Fischer, Richard.....'02	5 00	
Dawson, Edward S., Jr....'00-'01	10 00		Fish, Charles F.....'00-'01	10 00	
Dawson, John H.....'01	5 00	7 50	Fisher, George W.....'02	5 00	
Day, Edward J.....'01-'02	10 00		Fletcher, John W.....'01	5 00	
Day, William B.....'01	5 00		Foster, John B.....'01	5 00	
De Jonge, Cornelius.....'01-'02	10 00		Fouch, William M.....'01-'02	10 00	
De Lang, Alfred.....'01	5 00		Foulke, James.....'02	5 00	
Deck, Lewis C.....'01-'02	10 00		Fox, Peter P.....'02	5 00	
Depeyre, Louis N.....'01	5 00		Frames, J. Fuller.....'01	5 00	
Devine, John.....'02	5 00		Frauer, Herman F.....'01-'02	10 00	
Dewender, William H.....'02	5 00		French, Harry B.....'02	5 00	
Dewoody, William L.....'02	5 00		Frerichs, Frederick W.....'01	5 00	
Dickinson, Arthur L....'01	5 00		Fricke, Frederick H.....'01	5 00	
Diebert, Thomas I.....'02	5 00		Friedewald, Hermann W.....'01	5 00	
Diekman, George C.....'02	5 00		Frohwein, Richard.....'01	5 00	
Dilly, Oscar C.....'02	5 00		Frost, William A.....'01	5 00	
Dimmitt, Addison.....'02	5 00		Frye, George C.....'02	5 00	
Dinkler, Frank A.....'02	5 00		Funsch, Oliver J.....'01	5 00	
Dixon, J. Marion.....'02	5 00		Gaesser, Theobald T.....'01-'02	10 00	
Dobbins, Edward T.....'02	5 00		Gale, Walter H.....'01	5 00	
Dohme, Alfred R. L.....'02	5 00		Gallagher, John C.....'01	5 00	
Dohme, C. Louis....'02	5 00		Gane, Eustace H.....'01	5 00	
Donahue, James.....'01	5 00		Gano, William H.....'02	5 00	
Donahue, Theresa V.....'01	5 00		Garber, Elmer F. W.....'01-'02	10 00	
Dorr, George W.....'01	5 00		Gardner, Robert W.....'02	5 00	
Downing, Benjamin F., Jr.'01-'02	10 00		Gaus, Charles H.....'01	5 00	
Drake, Frederick T.....'01	5 00		Gayle, John W.....'02	5 00	
Dresser, George E.....'99-'00	10 00		Geisler, Joseph F.....'02	5 00	
Drew, Walter L.....'01	5 00		Gessner, Emil A.....'02	5 00	
Du Bois, William L.....'00-'01	10 00		Gilchrist, Nellis R.....'01	5 00	
Duering, Henry C.....'01	5 00		Gilpin, Henry B.....'01-'02	10 00	
Dunham, Andrew A.....'01	5 00		Gleghorn, James S.....'01	5 00	
Dunn, John A.....'02	5 00		Gleim, John C.....'02	5 00	
Durban, Sebastian C.....'99	5 00		Glick, Harry E.....'01-'02	10 00	
Durkee, William C.....'01	5 00		Glover, William H.....'01	5 00	
Dutcher, Alfred L.....'01	5 00		Godbold, Fabius C.....'02	5 00	
Dye, Clair A.....'01-'02	10 00		Godding, John G.....'02	5 00	
Eads, Robert L.....'01-'02	10 00		Golden, Lee H.....'01	5 00	\$7 50
Eagny, James T.....'01	5 00		Good, James M.....'01	5 00	
Eberbach, Ottmar.....'02	5 00		Goodale, Harvey G.....'01	5 00	
Eberle, Eugene G.....'02	5 00		Gordin, Harry M.....'01	5 00	
Eberle, Herman T.....'01	5 00		Gorgas, George A.....'02	5 00	
Eccles, Robert G.....'01	5 00		Grace, William D.....'02	5 00	
Eckstein, Andrew J.....'02	5 00		Graf, Carl A.....'01	5 00	
Edelen, Charles A.....'01-'02	10 00		Grambois, Augustin.....'99	5 00	
Edwards, Fredk. B.....'01	5 00		Grassly, Charles W.....'02	5 00	
Ehrlicher, Henry M.....'01	5 00		Gray, Margaret McC.....'01	5 00	
Eichrodt, Chas. W.....'01-'02	10 00		Gray, William.....'02	5 00	
Eilbracht, William E.....'01	5 00		Green, Benjamin.....'02	5 00	
Amount carried forward.....	\$1160 00	\$30 00	Amount carried forward.....	\$1160 00	\$37 50

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	\$1625 00	\$37 50	Amount brought forward	\$2090 00	\$57 50
Green, Samuel L. ....'01	5 00	7 50	Howell, Edward V. ....'01-'02	10 00	
Greene, William R. ....'01-'02	10 00		Howson, Arthur B. ....'02	5 00	
Gregorius, George ....'01-'02	10 00		Hudnut, Richard A. ....'02	5 00	
Greve, Charles M. ....'02	5 00		Hudson, Arthur ....'01	5 00	
Grewe, Louis F. ....'01	5 00		Huested, Alfred B. ....'01-'02	10 00	
Greyer, Julius ....'01-'02	10 00		Huhn, George ....'02	5 00	
Griffith, Charles ....'01	5 00		Hummel, John A. ....'01-'02	10 00	
Griffiths, Joseph ....'01	5 00		Hurd, John C. ....'02	5 00	
Gross, William O. ....'01	5 00		Hurty, John N. ....'01-'02	10 00	
Grossjohann, Ernst. ....'02	5 00		Huston, Charles. ....'02	5 00	
Guerin, James F. ....'01	5 00		Hynson, Henry P. ....'02	5 00	
Guise, P. Netleton ....'01-'02	10 00		Ilhardt, William K. ....'01	5 00	
Haake, William H. ....'02	5 00		Ink, Charles E. ....'01-'02	10 00	
Haffner, Jean C. ....'01	5 00		Jackman, Wilbur F. ....'01-'02	10 00	
Hagee, William P. ....'01	5 00		Jackson, Frank A. ....'02	5 00	
Hagenow, Theodore F. ....'01	5 00		Jackson, William J. ....'01	5 00	
Hahn, Charles W. J. H. ....'01	5 00		Jacobs, Charles C. ....'01	5 00	7 50
Hall, Horace B. ....'01	5 00		Jelliffe, Smith E. ....'01	5 00	
Hall, Mary S. ....'01	5 00		Joergenson, Sophus. ....'01-'02	10 00	
Hall, William A. ....'01	5 00		Johnson, Charles B. ....'01	5 00	
Hallberg, Carl S. N. ....'01	5 00		Johnson, Ralph H. ....'01	5 00	
Hammer, Alrik ....'02	5 00		Jones, Alexander H. ....'02	5 00	
Hancock, Charles W. ....'02	5 00		Jones, David F. ....'01-'02	10 00	
Hannan, Owen B. ....'00-'01-'02	15 00		Jorgenson, Hans C. ....'01	5 00	
Hansen, Hans ....'01	5 00		Judd, Albert F. ....'01	5 00	
Harbaugh, Wilson L. ....'02	5 00	5 00	Judge, Charles R. ....'01	5 00	
Harris, Francis M. ....'00-'01	10 00		Jungmann, Julius ....'01	5 00	
Harrison, William J. ....'01-'02	10 00		Kaemmerer, William F. ....'02	5 00	
Hart, Joseph. ....'01	5 00		Kalish, Julius ....'02	5 00	
Harter, Isaac F. ....'02	5 00		Kalish, Oscar G. ....'02	5 00	
Hartwig, Otto J. ....'01	5 00		Kaltwasser, August P. ....'01	5 00	
Hassebrock, Henry F. ....'01	5 00		Kauffman, George B. ....'02	5 00	
Hassinger, Samuel E. R. ....'01	5 00		Kearney, James J. ....'01	5 00	
Hatton, Edgar M. ....'02	5 00		Kebler, Lyman F. ....'02	5 00	
Hatton, Ellmore W. ....'02	5 00		Keefer, Charles D. ....'99-'00	10 00	
Hauenstein, William ....'02	5 00		Keeney, Caleb R. ....'02	5 00	
Hausmann, Fredk. W. ....'01	5 00		Kennedy, Ezra J. ....'01	5 00	
Havenhill, L. D. ....'02	5 00		Kennedy, George W. ....'02	5 00	
Hay, Charles L. ....'01-'02	10 00		Kent, Henry A., Jr. ....'02	5 00	
Hay, Edward A. ....'02	5 00		Kerns, William B. ....'01	5 00	
Hayes, Horace P. ....'02	5 00		Kettler, Edward, Jr. ....'02	5 00	
Hayes, James H. ....'00-'01	10 00		Kienth, Hans. ....'02	5 00	
Haynes, David O. ....'01-'02	10 00		Kilmer, Frederick B. ....'02	5 00	
Hazlett, James L. ....'02	5 00		Kimball, Richard H. ....'01	5 00	
Hechler, George L. ....'02	5 00		King, Campbell T. ....'01	5 00	
Heebner, Charles F. ....'01	5 00		King, Ferdinand H. ....'01	5 00	
Heim, Henry ....'01	5 00		King, George A. N. ....'01	5 00	
Heinitsh, Sigmund W. ....'02	5 00		King, Robert B. ....'01	5 00	
Heinrich, Max P. ....'01	5 00		Kinney, Charles N. ....'01	3 00	
Heller, Charles T. ....'99-'00	10 00		Kirchgasser, William C. ....'02	5 00	
Hemm, Francis ....'01	5 00		Klein, Ernst F. ....'02	5 00	
Hemm, Louis P. ....'01-'02	10 00		Klie, G. H. Charles ....'01	5 00	
Hengst, J. Edwin ....'02	5 00		Kline, Mahlon N. ....'02	5 00	
Hephurn, John ....'01-'02	10 00		Knabe, Gustavus A. ....'01	5 00	
Hereth, Frank S. ....'02	5 00		Knoebel, Thomas ....'02	5 00	
Heydenreich, Emile . ....'02	5 00		Knoefel, Bruno. ....'02	5 00	
Hickerson, William H. ....'02	5 00		Knox, James W. T. ....'01	5 00	
Hinrichs, Carl G. ....'01	5 00		Koch, Louis ....'02	5 00	
Hinrichs, Gustavus D. ....'01	5 00		Koencke, Charles H. ....'01	5 00	
Hinton, Rufus G. ....'01	5 00		Kolb, William W. ....'02	5 00	
Hiriart, Sebastian ....'01	5 00		Kornmann, Henry ....'01	5 00	
Hirseman, Felix ....'01	5 00		Krause, John ....'01	5 00	
Hitchcock, John E. ....'01	5 00		Kremers, Edward. ....'01-'02	10 00	
Hoch, Aquila ....'01	5 00		Kuder, William F. ....'02	5 00	
Hollander, Joseph M. ....'01-'02	10 00	7 50	La Pierre, Elie H. ....'02	5 00	
Holliday, Francis E. ....'01	5 00		Laird, John ....'02	5 00	
Holmes, Henry E. ....'01	5 00		Lamar, Henry J. ....'01	5 00	
Hood, Charles I. ....'02	5 00		Lamar, William R. ....'01	5 00	
Hope, Robert L. ....'01-'02	10 00		Larrabee, John. ....'02	5 00	
Hopkins, Jesse L. ....'02	5 00		Latin, George ....'01	5 00	
Hopkins, Zerah B. ....'01-'02	10 00		Layton, Thomas ... ..'00-'01	10 00	
Hopp, Lewis C. ....'01	5 00		Le Richeux, Alfred C. ....'01	5 00	
Houghton, E. Mark ....'01	5 00		Legel, John G. ....'02	5 00	
Hover, William A. ....'02	5 00		Legendre, Joseph A. ....'01	5 00	
Howard, Fletcher. ....'01-'02	10 00		Leverty, John A. ....'01	5 00	
Amount carried forward	\$2090 00	\$57 50	Amount carried forward.	\$2520 00	\$65 00

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	\$2520 00	\$65 00	Amount brought forward	\$2955 00	\$77 50
Levinson, Joseph.....'02	5 00		Moerk, Frank X....'02	5 00	
Levy, Adolph.....'01	5 00		Moore, John T.....'02	5 00	
Lewis, Ernest G.....'01	5 00		Moore, Josh F.....'00-'01	10 00	
Lillie, Foress B.....'01	5 00		Morgan, Aylmer L.....'01-'02	10 00	
Lilly, Josiah K.....'01-'02	10 00		Morgan, Charles.....'01	5 00	
Lindly, John M.....'01-'02	10 00	5 00	Morris, Max.....'01	5 00	
Lindvall, Gus.....'02	5 00		Morse, Edward W.....'01	5 00	
Lockert, Charles L.....'00-'01	10 00		Mosher, William W.....'01-'02	10 00	
Long, John P.....'01	5 00		Mueller, Adolphus.....'02	5 00	
Loomis, John C.....'01	5 00		Mueller, Ambrose.....'01-'02	10 00	
Lord, Thomas.....'02	5 00		Muench, William.....'02	5 00	
Lowd, John C.....'01-'02	10 00		Mulford, Henry K.....'02	5 00	
Lowc, Clement B....'01	5 00		Mumma, Edgar.....'01	5 00	
Lowell, Edward M.....'02	5 00		Murphy, John S.....'01	5 00	
Lueder, Fritz.....'02	5 00		Murray, Benjamin L.....'00-'01	10 00	
Lyon, George C.....'02	5 00		Muth, George L.....'02	5 00	
Lyons, Albert B.....'01	5 00		Muth, John C.....'02	5 00	
Lyons, Isaac L.....'02	5 00		Muth, John S.....'02	5 00	
Macy, Sherman R.....'01	5 00		Myers, Daniel.....'02	5 00	
Maguire, Edward S.....'02	5 00		Myers, Preston B.....'01	5 00	
Maisch, Henry.....'01	5 00		Nachtwey, Frank J.....'01	5 00	
Mallinckrodt, Edward....'01-'02	10 00		Nattans, Arthur....'02	5 00	
Mansfield, Samuel.....'01	5 00		Naylor, William W.....'01	5 00	
Mares, Ferdinand L.....'01-'02	10 00		Neville, William R.....'01	5 00	
Martin, Nicholas H.....'02	5 00		Newman, George A.....'02	5 00	
Mason, Harry B.....'01	5 00		Newton, Philo W.....'01	5 00	
Mason, George H., Jr.....'02	5 00		Nichols, John C.....'01	5 00	
Matthews, Charles E.....'02	5 00		Nichols, Thomas B....'99-'00-'01	15 00	
Matusow, Harry.....'01-'02	10 00		Nixon, Charles F.....'01-'02	10 00	
May, Charles C.....'01	5 00		Noll, Martin J.....'01	5 00	
May, Edward.....'02	5 00		Noll, Mathias.....'96-'97-'98	15 00	
May, James O.....'01	5 00		Noll, Mathias.....'01-'02	10 00	
Mayo, Caswell A.....'00-'01	10 00		Nordmann, Herman.....'02	5 00	
Mayo, Frederick W.....'01	5 00	7 50	Norton, George E.....'02	5 00	
McConnell, Charles H.....'02	5 00		O'Gorman, Theophilus V....'02	5 00	
McDonald, George.....'01	5 00		O'Hare, James.....'02	5 00	
McElhenie, Thomas D.....'01	5 00		O'Neil, Henry M.....'01-'02	10 00	
McGill, John T....'02	5 00		Ogier, John M.....'01-'02	10 00	
McIntyre, Byron F.....'99	5 00		Ogier, William R.....'01-'02	10 00	
McIntyre, Ewen.....'02	5 00		Ohliger, Lewis P.....'01	5 00	
McIntyre, William.....'02	5 00		Oleson, Olaf M.....'01-'02	10 00	
McKesson, G. Clinton ...'01-'02	10 00		Oliver, William M.....'02	5 00	
McKesson, John, Jr.....'02	5 00		Orton, Ingomar F.....'02	5 00	
McKinney, Robert S.....'01	5 00		Ottinger, James J.....'02	5 00	
McLarty, Colin.....'01	5 00		Parmalee, Walter W.....'01	5 00	
McMahon, Joseph.....'02	5 00		Partridge, Charles K.....'01-'02	10 00	
Meisner, F. W., Jr.....'02	5 00		Partridge, Frank R.....'01	5 00	
Menk, Charles W.....'01	5 00		Patch, Edgar L.....'01-'02	10 00	
Mennen, Gerhard.....'01	5 00		Patten, Eustis.....'01	5 00	
Mente, Alvin W.....'01-'02	10 00		Pattison, George H.....'01	5 00	
Meredith, H. Lionel ....'01-'02	10 00		Patton, John F.....'02	5 00	
Merrell, Charles G.....'02	5 00		Pauley, Frank C.....'01	5 00	
Merrell, George.....'02	5 00		Peacock, Bertha L.....'02	5 00	
Merrell, George R.....'01	5 00		Peacock, Josiah C.....'02	5 00	
Merrem, Charles D.....'01	5 00		Pearce, Howard A.....'02	5 00	
Methudy, Joseph P.....'01	5 00		Peck, George L.....'02	5 00	
Meyer, Charles L.....'01	5 00		Pennock, Edward ....'99-'00-'01	15 00	
Meyer, Martin M.....'02	5 00		Perkins, George H.....'01	5 00	
Meyer, Theodore F.....'01	5 00		Perry, Frederick W. R....'00-'01	10 00	
Michaelis, Gustavus.....'02	5 00		Peter, Minor C.....'02	5 00	
Millard, David R.....'02	5 00		Petsche, Bismarck Wm.....'01	5 00	
Miller, Charles.....'01	5 00		Pfaff, Franz.....'02	5 00	
Miller, Charles E.....'02	5 00		Pfafflin, Henry A. '99-'00-'01-'02	20 00	
Miller, Emerson R.....'01	5 00		Pfeffer, William J.....'01	5 00	
Miller, Herman.....'01	5 00		Philibert, Leon D.....'01	5 00	
Miller, Jacob A.....'01	5 00		Pleck, Edward L.....'01-'02	10 00	
Miller, T. Ashby.....'02	5 00		Pierce, William H.....'02	5 00	
Miller, William H.....'02	5 00		Pile, Gustavus.....'01	5 00	
Milligan, Decatur.....'02	5 00		Pilkington, William B.....'01	5 00	
Milligan, John D.....'01	5 00		Pilson, Abram O.....'02	5 00	
Milliken, John T.....'01	5 00		Pitt, John R.....'02	5 00	
Miner, Maurice A.....'01	5 00		Plaut, Albert.....'02	5 00	
Minner, Louis A.....'01	5 00		Porter, Chilton S.....'01	5 00	
Mittelbach, William.....'02	5 00		Post, Arthur E.....'01	5 00	
Mix, Willis L.....'01-'02	10 00		Potts, David G.....'02	5 00	
Amount carried forward.....	\$2955 00	\$77 50	Amount carried forward.....	\$3450 00	\$77 50

ALPHABETICAL LIST OF

	Annual Dues.	Certificates.	
Amount brought forward	\$3450 00	\$77 50	Amou
Powell, William C. '01	5 00		Schoettl
Preissler, Henry W. '01	5 00		Schrade
Preston, Andrew P. '01-'02	10 00		Schrank
Price, Charles H. '02	5 00		Schreib
Price, Joseph '02	5 00		Schreine
Prutzman, Charles O. '01	5 00		Schuelle
Puckner, William A. '02	5 00		Schuh, I
Punch, William F. '99	5 00		Schulze,
Quackinbush, Benj. F. '02	5 00		Schuma
Raeuber, Edward G. '02	5 00		Schurk,
Rains, A. Brown. '01	5 00		Scott, G
Ramaley, Francis '02	5 00		Scott, W
Rand, Daniel M. '01	5 00		Scoville,
Randall, Frank O. '00-'01	10 00		Searby,
Rapelye, Charles A. '01	5 00		Seinsoth
Rauschenberg, Sidney '01	5 00		Seitz, L
Reade, Frank M. '01	5 00		Seltzer,
Reidy, Michael '01-'02-'03	15 00		Selzer, F
Reilly, Robert C. '01	5 00		Sempill,
Remington, J. Percy '01-'02	10 00		Sennewa
Renshaw, Thomas W. '01	5 00	7 50	Serodino
Reynolds, Charles E. '01-'02	10 00		Shafer, F
Reynolds, John J. '01	5 00		Shannon
Rhode, Rudolph E. '02	5 00		Sharples
Rhodes, Charles O. '01	5 00		Shendal,
Richardson, Horatio S. '02	5 00		Sherman
Richardson, Samuel W. '01-'02	10 00		Sherwood
Richardson, Thomas L. '01	5 00		Shoemak
Riddell, Benjamin F. '02	5 00		Shoults,
Riley, Cassius M. '01-'02	10 00		Schwab,
Riley, Russell. '01	5 00		Sicker, F
Roberts, James F. '01	5 00		Silverbur
Robins, Wilbur F. '01-'02	10 00		Simmons
Rockefeller, Howard '01	5 00		Simon, W
Rockefeller, Lucius. '02	5 00		Simson, I
Rodemoyer, William E. '01-'02	10 00	5 00	Slade, H
Roesch, Anton '01	5 00		Slater, Fr
Rogers, Arthur H. '01	5 00		Sloss, Ro
Rogers, William H. '02	5 00		Small, He
Rose, Herman L. '01-'02	10 00		Smallwoo
Rosenthal, David A. '02	5 00		Smith, B.
Rosenzweig, Benj. '02	5 00		Smith, Ch
Roth, Charles R. '01	5 00		Smith, Cl
Rowlinski, Robert A. '01	5 00		Smith, Ge
Ruddiman, Edsel A. '02	5 00		Smith, La
Ruenzel, Henry G. '02	5 00		Smith, Lir
Runyon, Edward W. '99-'00	10 00		Smith, Th
Ruppert, John '01	5 00		Smith, Wi
Rusby, Henry H. '02	5 00		Smithson,
Ryan, Frank G. '01-'02	10 00		Snodgrass,
Sadtler, Samuel P. '02	5 00		Snow, Cha
Samson, Max '01-'02	10 00		Sohrbeck,
Sawyer, Charles H. '02	5 00		Sohrbeck,
Sayre, Edward A. '02	5 00		Solomons,
Sayre, Lucius E. '02	5 00		Sombart, J
Sayre, William H. '01	5 00		Sords, Tho
Schaefer, Emil A. '02	5 00		Spalding,
Schafer, George H. '01	5 00		Sparks, Ja
Schellentrager, Ernst A. '99	5 00		Spilker, H
Scherer, Andrew '02	5 00		Sprague, V
Schieffelin, William J. '02	5 00		Squibb, Ch
Schiemann, Edward B. '02	5 00		Squibb, Ed
Schimps, Henry W. '02	5 00		St. Jacques
Schlaepfer, Henry J. '02	5 00		St. John, S
Schlotterbeck, Augustus G. '02	5 00		Staehle, Lo
Schmid, Henry '02	5 00		Stahlhuth,
Schmidt, Ferdinand T. '01	5 00		Stamford, V
Schmidt, Florian C. '01-'02	10 00		Stamm, Dan
Schmidt, Frederick M. '02	5 00		Stange, Car
Schmidt, Valentine '01	5 00		Stearns, Fr
Schmitt, George J. F. '02	5 00		Steele, Geo
Schmitter, Jonathan '01	5 00		Stegner, En
Schneider, Albert. '01	5 00		Steinmeyer
Schoenhut, Christie H. '02	5 00		Stewart, Fr
Schoenthaler, John P. '01	5 00		Stille, Adol
Amount carried forward.	\$3900 00	\$90 00	Amount c

	Annual Dues.	Certificates.		Annual Dues.	Certificates.
Amount brought forward	\$4370 00	\$105 00	Amount brought forward	\$4715 00	\$120 90
Stoddart, Thomas '02-'03	10 00		Warn, William E. '02	5 00	
Stone, Clarence G. '01-'02	10 00		Watson, Herbert K. '01	5 00	
Stoughton, Dwight G. '01	5 00		Watt, George H. '01	5 00	
Stowell, Daniel '01	5 00		Watters, Henry '01	5 00	
Stroup, Freeman P. '02	5 00		Weaver, Francis M. '01	5 00	
Stuart, William A. '01	5 00		Webb, William H. '02	5 00	
Sturmer, Julius W. '01	5 00		Webber, J. Le Roy. '02	5 00	
Sultan, Frederick W. '01	5 00		Weber, Peter J. '01	5 00	
Suppiger, Albert E. '01	5 00		Weidemann, Chas. A. '02	5 00	
Sweet, Caldwell '02	5 00		Weiss, Conrad H. '01	5 00	
Symonds, Arthur H. '01-'02	10 00		Wells, Edwin H. '99-'00-'01	15 00	
Taber, Joseph M. '01-'02	10 00		Wendel, H. Edward '02	5 00	
Taylor, George E. '02	5 00		Wendt, William C. '01-'02	10 00	
Taylor, Mallory H. '01	5 00		Wenzell, William T. '02	5 00	
Temm, William D. '01	5 00		Wescott, William C. '01	5 00	
Thames, Joseph J. '01	5 00		Wesner, Henry C. '01-'02	10 00	
Thomas, Daniel J. '02	5 00		West, Charles A. '01-'02	10 00	
Thomas, Oscar F. '99	5 00		Westcott, James W. '00-'01	10 00	
Thomas, Robert, Jr. '02	5 00		Wetterstroem, Albert '01	5 00	
Thomasson, Andere '02	5 00		Wetterstroem, Theodore D. '02	5 00	
Thorn, Henry P. '02	5 00		Whelpley, Henry M. '01	5 00	
Thurston, Azor '01	5 00		Whitcomb, Frederick E. '01	5 00	
Thweatt, Archibald. '01	5 00		White, Herbert E. '02	5 00	
Tigner, James O. '02	5 00		White, Richard E. '01	5 00	
Tilden, Amos K. '01	5 00		Whitehead, Eugene T. '01	5 00	
Tobin, John M. '01	5 00		Whitney, Edgar F. '01-'02	10 00	
Todd, Albert M. '02	5 00		Wichelns, Frederick '02	5 00	
Tontz, George W. '01	5 00		Wickham, William H. '02	5 00	
Topley, James '02	5 00		Wikle, Jesse L. '01	5 00	
Topping, Charles O. '02	5 00		Wilbur, Lot '02	5 00	
Torbert, Willard H. '02	5 00		Williams, George C. '01-'02	10 00	
Tracy, David W. '01	5 00		Williams, John R. '01	5 00	
Treat, Joseph A. '02	5 00		Williams, Richard W. '02	5 00	
Troxler, Constantine, Jr. '02	5 00		Williams, Seward W. '01	5 00	
Truax, Charles '01	5 00		Willis, Henry '01	5 00	
Tucker, Greenleaf R. '01	5 00		Wisdom, Hugh '01	5 00	
Turner, George H. '99-'00	10 00		Wittich, Matthew H. '01-'02	10 00	
Turnquist, Carl M. '01-'02	10 00	7 50	Wittmer, Joseph W., Jr. '02	5 00	
Tuthill, Frederic P. '01	5 00		Wolf, Henry A. '01	5 00	5 00
Uhlich, Ferdinand G. '01	5 00		Wolff, Edward H. '01	5 00	
Van Winkle, Abraham. '01	5 00		Wood, Alonzo F., Jr. '02	5 00	
Varney, Edward F. '01	5 00		Wood, Edward S. '02	5 00	
Vitt, Rudolph S. '01	5 00		Wood, James P. '02	5 00	
Vockroth, Emil '01-'02	10 00		Wood, John W. '02	5 00	
Voight, Joseph F. '02	5 00		Woodman, Walter I. '02	5 00	
Voiss, Arcadius '02	5 00	7 50	Woodruff, Roderick S. '98	5 00	
Vordick, August H. '01	5 00		Woods, Charles H. A. '01	5 00	
Voss, George W. '02	5 00		Woodworth, Charles B. '02	5 00	
Votteler, William '02	5 00		Wright, Charles L. '01	5 00	
Waddell, Minor T. '01-'02	10 00		Wuensach, Charles '01	5 00	
Walbrach, Arthur '01	5 00		Wulling, Fred'k J. '01-'02	10 00	
Walbridge, Cyrus P. '01	5 00		Wunderlich, Edward '01	5 00	
Walker, John P. '02	5 00		Wurmb, Theodore H. '01	5 00	
Walker, William J. '02	5 00		de Wyl, Frederica '01	5 00	
Wall, Otto A. '01	5 00		Zellhoefer, George. '98-'99-'00	15 00	
Walter, Charles A. '01-'02	10 00		Zemp, William R. '01-'02	10 00	
Wangler, Conrad D. '02	5 00		Ziegler, Philip M. '02	5 00	
Wanous, Josie '01	5 00		Zimmermann, Albert '02	5 00	
Ward, A. Jae '02	5 00		Zoeller, Edward V. '02	5 00	
Ward, Homer B. '01	5 00		Zuenkeler, J. Ferd. '02	5 00	
Ware, Charles H. '01	5 00		Zwick, Karl G. '02	5 00	
Amount carried forward	\$4715 00	\$120 00	Totals.	\$5085 00	\$125 00

LIST OF COLLEGES AND ASSOCIATIONS.

HAVING ACCREDITED DELEGATES TO THE FIFTIETH ANNUAL MEETING, HELD AT PHILADELPHIA, PA., WITH THE NAMES OF THEIR PRESIDENTS AND SECRETARIES.

COLLEGES OF PHARMACY.

<i>Name.</i>	<i>President.</i>	<i>Secretary.</i>
Albany	Wm. J. Walker.....	Theo. J. Bradley.
Atlanta	Howard Van Epps.....	Geo. F. Payne.
California	Gaston E. Bacon	Wm. M. Searby.
Chicago	A. S. Draper	W. B. Day.
Cleveland	E. A. Schellentrager.....	Joseph Feil.
Highland Park	O. H. Longwell	L. C. Thornburg.
Maryland	Chas. E. Dohme.....	Chas. H. Ware.
Massachusetts	Wm. D. Wheeler	Geo. E. Coleman.
National	A. J. Schafhirt	W. H. Bradbury.
New Jersey	Wm. O. Kuebler.....	Julius K. Egge.
New York	Chas. F. Chandler	Thos. F. Main.
Ontario	Jas. F. Roberts	I. T. Lewis.
Philadelphia	Howard B. French.....	C. A. Weidemann.
Pittsburg	Louis Emanuel.....	H. L. Lohmeyer.
St. Louis	Theo. F. Hagenow.....	J. C. Falk.

SCHOOLS OF PHARMACY.

Northwestern University	Chicago, Ill.	Oscar Oldberg, <i>Dean</i> .
Purdue University.....	Lafayette, Ind.	Arthur Green, <i>Dean</i> .
University of Iowa	Iowa City, Ia.	Emil L. Boerner, <i>Dean</i> .
University of Kansas	Lawrence, Kan.	Lucius E. Sayre, <i>Dean</i> .
University of Michigan	Ann Arbor, Mich.	A. B. Prescott, <i>Dean</i> .
University of Minnesota	Minneapolis, Minn.	F. J. Wulling, <i>Dean</i> .
University of Wisconsin.....	Madison, Wis.	Edward Kremers, <i>Dean</i> .
Vanderbilt University.....	Nashville, Tenn.....	John T. McGill, <i>Dean</i> .

ALUMNI ASSOCIATIONS OF COLLEGES OF PHARMACY.

<i>Name.</i>	<i>President.</i>	<i>Secretary.</i>
Chicago	E. D. Irvine	F. H. S. Gazzolo.
Maryland	J. E. Hengst	W. C. Parkhurst.
New York	Chas. S. Erb	Geo. J. Dürr.
Northwestern University	Harry Kahn	
Philadelphia	Wm. G. Nebig	Wm. E. Krewson.
St. Louis	W. H. Lamont	E. H. Voepel.

STATE PHARMACEUTICAL ASSOCIATIONS.

<i>Name.</i>	<i>President.</i>	<i>Secretary.</i>
Alabama	L. S. Brigham.....	W. E. Bingham.
Arkansas	W. R. Appleton	L. K. Snodgrass.
Colorado	A. W. Scott.....	Chas. E. Ward.
Connecticut	A. L. Dickinson.....	C. A. Rapelye.
Delaware	E. L. Clarke	F. W. Fenn.
Florida	J. A. Conover.	
Georgia	C. D. Jordan.....	J. B. Riley.
Illinois	H. Swannell	R. N. Dodds.
Indiana	O. C. Bastian	A. Timberlake.
Iowa	H. S. Baker	Fletcher Howard.
Kansas	J. W. Cookson	E. E. Lair.
Kentucky	H. K. McAdams	J. W. Gayle.
Louisiana	Walter T. Taylor	W. P. Duplantis.
Maine	D. P. Moulton	M. L. Porter.
Maryland	J. W. Foster	O. C. Smith.
Michigan	Lon G. Moore	W. H. Burke.
Minnesota	And. J. Eckstein.....	Theo. F. Leeb.
Missouri ..	R. L. Hope.....	H. M. Whelpley.
Nebraska	P. Strassbaugh	W. M. Tonner.
New Hampshire	H. E. Rice	J. H. Marshall.
New Jersey	H. J. Lohmann.....	F. C. Stutzlen.
New York	Thos. Stoddart	E. S. Dawson, Jr.
North Carolina	H. T. Hicks	P. W. Vaughan.
Ohio	O. N. Garrett	L. C. Hopp.
Oklahoma	J. C. Burton	F. M. Weaver.
Pennsylvania	Chas. L. Hay	J. A. Miller.
Province of Nova Scotia	C. E. Huggins.....	E. T. Power.
Province of Quebec	S. Lachance	E. Muir.
South Carolina	J. A. Barbot	F. M. Smith.
South Dakota	C. W. Peaslee.....	E. C. Bent.
Texas	E. G. Eberle ...	R. H. Walker.
Vermont	A. L. Dutcher.....	Chas. W. Ward.
Virginia	R. C. Petzold	C. B. Fleet.
Washington	J. W. McArthur	W. P. Bonney.
Wisconsin	E. B. Heimstreet	H. Rollmann.

NATIONAL ASSOCIATIONS.

<i>Name.</i>	<i>President.</i>	<i>Secretary.</i>
American Medical	Frank Billings, M. D.	Geo. H. Simmons, M. D.
Canada Wholesale Druggists ..	W. S. Kerry.	
Retail Druggists	Jas. W. Seely	Thos. V. Wooten.
Wholesale Druggists	W. J. Walding	J. E. Toms.

LIST OF MEMBERS AND DELEGATES IN ATTENDANCE AT PHILADELPHIA, PA.

Names of delegates indicated by *; delegates not members by *†.

- | | |
|---|--|
| <p>Alpers, Wm. C., New York, N. Y.
 * Anderson, Wm. C., Brooklyn, N. Y.
 * Ardery, L., Hutchison, Kan.
 * Arny, H. V., Cleveland, O.
 Averill, W. H., Frankfort, Ky.
 Baer, J. M., Philadelphia, Pa.
 * Baird, J. W., Boston, Mass.
 Baker, T. Roberts, Richmond, Va.
 Bamford, M. W., Philadelphia, Pa.
 Barrett, C. L., Camden, N. J.
 * Bartley, E. H., Brooklyn, N. Y.
 Base, Dan'l, Baltimore, Md.
 * Battle, Orrin M., Fulton, Ark.
 * Beal, James H., Scio, O.
 Beck, Jno. G., Baltimore, Md.
 Benfield, C. W., Cleveland, O.
 * Bennett, Chas. H., Pipestone, Minn.
 * Berger, E., Tampa, Fla.
 Beringer, Geo. M., Camden, N. J.
 Betzler, Jacob, Newark, N. J.
 *† Biddle, Clement, M. D., Philadelphia, Pa.
 Bigelow, Clarence O., New York, N. Y.
 * Biroth, Henry, Chicago, Ill.
 Blackmore, Henry S., Mt. Vernon, N. Y.
 Blair, Henry C., Philadelphia, Pa.
 Blakely, Collins, Montpelier, Vt.
 * Boeddiker, Otto, New York, N. Y.
 Boehm, Solomon, St. Louis, Mo.
 * Boerner, Emil L., Iowa City, Ia.
 Bond, John B., Little Rock, Ark.
 Bostick, E. E., Philadelphia, Pa.
 * Boyd, Chas. N., Butler, Pa.
 Boynton, H., Biddeford, Me.
 Brookes, Virginia C., Miss, Waelder, Tex.
 Brown, Wm. T., Madison, N. J.
 Brucker, Carl, New York, N. Y.
 Brundage, A. H., Brooklyn, N. Y.
 Burg, J. D., Philadelphia, Pa.
 * Burgheim, Jacob, Houston, Tex.
 * Burke, Wm. H., Detroit, Mich.</p> | <p>Butler, F. H., Lowell, Mass.
 Byers, H. C., Pottstown, Pa.
 Byrne, John, Columbus, O.
 Campbell, Geo. D., Lonaconing, Md.
 Campbell, Milton, Philadelphia, Pa.
 Campbell, Theodore, Philadelphia, Pa.
 * Candidus, Philip C., Mobile, Ala.
 Carpenter, A. B., Greenville, S. C.
 Carrell, Eugene A., Morristown, N. J.
 Carter, Frank H., Indianapolis, Ind.
 Caspari, Chas., Jr., Baltimore, Md.
 Caspari, Chas. E., St. Louis, Mo.
 Casper, Thos. J., Springfield, O.
 * Chandler, Chas. F., New York, N. Y.
 *† Clarke, E. L., Dover, Del.
 * Claus, Otto F., St. Louis, Mo.
 * Cleveland, J. M., Elberton, Ga.
 Coblentz, Virgil, New York, N. Y.
 Cone, E. H., Cincinnati, O.
 Cook, E. F., Philadelphia, Pa.
 Cook, Thos. P., New York, N. Y.
 *† Cozens, N. A., Philadelphia, Pa.
 Dadd, Rob't M., Milwaukee, Wis.
 * Daggett, V. C., New York, N. Y.
 *† Danforth, N. B., Wilmington, Del.
 * Dare, Chas. F., Bridgeton, N. J.
 Davis, Chas. L., Newburyport, Mass.
 * Depeyre, Louis N., Denver, Colo.
 * Diekman, Geo. C., New York, N. Y.
 * Diehl, C. Lewis, Louisville, Ky.
 * Dohme, A. R. L., Baltimore, Md.
 Dohme, Chas. E., Baltimore, Md.
 Dohme, Louis, Baltimore, Md.
 * Duckett, Walter G., Washington, D. C.
 Duering, Henry C., St. Louis, Mo.
 Dunn, John A., Brooklyn, N. Y.
 Dunning, H. A. Brown, Baltimore, Md.
 Eaton, Harvey K., New York, N. Y.
 * Eberle, Eug. G., Dallas, Tex.
 * Ebert, Albert E., Chicago, Ill.</p> |
|---|--|

LIST OF MEMBERS IN ATTE

Eccles, Robert G., Brooklyn, N. Y.	*Hatcher
*Eckert, John, Newark, N. J.	Hauenste
Eigelberner, H. B., Philadelphia, Pa.	Hay, Cha
Elliot, Chas. H., Washington, D. C.	Hays, Fra
Ellis, Evan T., Philadelphia, Pa.	*Hechler,
*Emanuel, Louis, Pittsburg, Pa.	Heinitsh,
England, Joseph W., Philadelphia, Pa.	Heintzelm
Eppstein, Jacob, Philadelphia, Pa.	Helfman,
Erb, Chas. S., New York, N. Y.	Hengst, J.
*Etzel, John L., Clear Lake, Ia.	*Henry, F
Evans, Geo. B., Philadelphia, Pa.	Herbst, W
Evans, Joseph T., West Chester, Pa.	*†Herbst,
Fairchild, Benj. T., New York, N. Y.	Hicks, Hei
Feick, Chas., Baltimore, Md.	High, Ray
Feidt, Geo. D., Philadelphia, Pa.	Hilton, S. I
*†Fenn, F. W., Wilmington, Del.	Hoch, Aqu
*Fischer, Dora C., Leavenworth, Kan.	Holliday, F
Fisk, Frank E., Chicago, Ill.	*Holmes, C
*Flemer, Louis, Washington, D. C.	*Holzhauer
Foulke, James, Jersey City Heights, N. J.	Hopkins, J
Fox, Peter P., Philadelphia, Pa.	*Hopkins, J
Frames, J. Fuller, Baltimore, Md.	*Hopp, Lev
*†French, Rollin H., Philadelphia, Pa.	Horne, W.
*Fricke, F. H., St. Louis, Mo.	*Howard, F
*Frost, Wm. A., St. Paul, Minn.	*Husted, A
Gable, Ralph B., New York, N. Y.	*Hurty, Jno
Gaesser, Theo. T., Troy, Ind.	Hynson, He
*Gallagher, John C., Jersey City, N. J.	Ilhardt, W. I
Gane, Eustace H., New York, N. Y.	James, Fran
Gano, W. H., Philadelphia, Pa.	*†Jauncy, W
Garber, E. W., Mount Joy, Pa.	Jenks, Wm.
*Gayle, Jno. W., Frankfort, Ky.	*Jones, Davi
*Gibbard, G. E., Toronto, Can.	Jones, Simon
*Good, James M., St. Louis, Mo.	Jorden, H. A
*Gordin, H. M., Chicago, Ill.	Jungmann, J
Gordon, Fred'k T., Philadelphia, Pa.	Kaemmerer,
Gordon, Jean, Chicago, Ill.	Kauffman, G
Gordon, Wm. J. M., Cincinnati, O.	Kebler, Lyma
Grace, Wm. D., Portsmouth, N. H.	Keefer, Chas.
Gray, Maggie M., Mrs., Chicago, Ill.	Kennedy, E.
*Gregorius, Geo., New York, N. Y.	Kennedy, Geo
*Grewe, L. F., St. Louis, Mo.	Kephart, Phil
Griffith, Chas., Johnstown, Pa.	Kettler, Edwa
Haake, Wm. A., Cleveland, O.	Kilmer, Fred
Haddad, S. F., New York, N. Y.	*Klein, Ernest
*Hallberg, C. S. N., Chicago, Ill.	Kline, Clarenc
Hance, Edw. H., Philadelphia, Pa.	Kline, Mahlon
Hancock, Chas. W., Langhorne, Pa.	Knoefel, Chas
Hancock, Jno. F., Baltimore, Md.	Knox, J. W. T
*Harrison, Robert L., Richmond, Va.	*Koch, Julius
Harrison, Wm. J., Lakewood, N. J.	*Kraemer, He
*Hassebrock, H. F., St. Louis, Mo.	*†Krauss, Otto

- *Kremers, Edward, Madison, Wis.
 Krewson, W. E., Philadelphia, Pa.
 Krueger, O. W., Kansas City, Mo.
 *†Kunze, H. A., St. Louis, Mo.
 *Lachance, S., Montreal, Can.
 Land, Robert H., Augusta, Ga.
 Land, Robert H., Jr., Augusta, Ga.
 La Wall, Chas. H., Philadelphia, Pa.
 Leedom, Chas., Philadelphia, Pa.
 Lehritter, J. P., New York, N. Y.
 Lemberger, Jos. I., Lebanon, Pa.
 *Leslie, W. A., Morgantown, N. C.
 Lindly, J. M., Winfield, Ia.
 *Lindvall, Gus., Moline, Ill.
 Lloyd, Jno. U., Cincinnati, O.
 Lohmann, H. J., Jersey City, N. J.
 *Lowe, C. B., Philadelphia, Pa.
 Lyons, A. B., Detroit, Mich.
 *MacRae, J. Y., Norfolk, Va.
 *Macy, S. R., Des Moines, Ia.
 *Main, Thos. F., New York, N. Y.
 Mason, Harry B., Detroit, Mich.
 May, Chas. C., St. Louis, Mo.
 May, Louis, Brooklyn, N. Y.
 *Mayo, C. A., New York, N. Y.
 McIntyre, Ewen, New York, N. Y.
 McIntyre, Wm., Philadelphia, Pa.
 *Meissner, F. W., La Porte, Ind.
 Menk, Chas. W., Newark, N. J.
 Mentzer, H. H., Philadelphia, Pa.
 Meredith, H. Lionel, Hagerstown, Md.
 Meyer, Chas. L., Baltimore, Md.
 Meyer, C. F. G., St. Louis, Mo.
 Michels, V. C., Albion, Ill.
 Miller, A. W., Philadelphia, Pa.
 *Mittelbach, Wm., Boonville, Mo.
 Moerk, F. X., Philadelphia, Pa.
 Moore, J. B., Philadelphia, Pa.
 Morgan, Chas., Baltimore, Md.
 *Morris, Max, Atlanta, Ga.
 Morse, Edw. W., Mt. Vernon, Ill.
 Mosher, W. W., Meriden, Conn.
 Mulford, H. K., Philadelphia, Pa.
 Nattans, Arthur, Baltimore, Md.
 O'Neill, H. M., New York, N. Y.
 Ogier, Wm. R., Columbus, O.
 Ottinger, J. J., Philadelphia, Pa.
 *Parisen, Geo. W., Perth Amboy, N. J.
 Parsons, Chas. W., New York, N. Y.
 *Patch, E. L., Boston, Mass.
 *Patton, Jno. F., York, Pa.
 Payne, Geo. F., Atlanta, Ga.
 Peterson, Jno. M., Bayonne, N. J.
 Petsche, B. W., Yonkers, N. Y.
 *Pettit, Henry M., Carrollton, Mo.
 Pieck, Edw. L., Covington, Ky.
 Pine, Warren C., Riverside, N. J.
 *†Plump, Fred. H., New York, N. Y.
 *Powell, Wm. C., Snow Hill, Md.
 *Prescott, A. B., Ann Arbor, Mich.
 Procter, Wallace, Philadelphia, Pa.
 *Puckner, Wm. A., Chicago, Ill.
 Rapelye, Chas. A., Hartford, Conn.
 Redsecker, Jacob, Lebanon, Pa.
 Reed, W. H., Norristown, Pa.
 *†Rehfuss, Chas., Philadelphia, Pa.
 Reidy, M., Corunna, Mich.
 *Reilly, R. C., St. Louis, Mo.
 Remington, J. P., Philadelphia, Pa.
 Remington, J. Percy, Philadelphia, Pa.
 *Richardson, S. W., St. Louis, Mo.
 Riley, Cassius M., Alton, Ill.
 Rittenhouse, H. N., Philadelphia, Pa.
 *Roe, J. Newton, Valparaiso, Ind.
 *Rochrig, A. M., New York, N. Y.
 Rogers, Anthony C., Gloucester, Mass.
 Rogers, Arthur H., Geneseo, N. Y.
 Rosengarten, Geo. D., Philadelphia, Pa.
 Robinson, Wm. J., New York, N. Y.
 Rosenthal, D. A., Knoxville, Tenn.
 Rosenzweig, B., Brooklyn, N. Y.
 Roth, C. R., Canton, O.
 *Ruddiman, E. A., Nashville, Tenn.
 Ruhl, H. F., Manheim, Pa.
 Runyon, Edw. W., New York, N. Y.
 *Rushy, H. H., New York, N. Y.
 Ryan, Frank G., Detroit, Mich.
 Sadtler, Sam'l P., Philadelphia, Pa.
 *Samson, Max, New Orleans, La.
 *Sander, Enno, St. Louis, Mo.
 *Sauvinet, C. D., New Orleans, La.
 *Sargent, E. H., Chicago, Ill.
 Saunders, Wm., Ottawa, Can.
 *Sayre, Edw. A., New York, N. Y.
 *Sayre, Lucius E., Lawrence, Kan.
 Sayre, Wm. H., Newark, N. J.
 Scherling, Gus., Sioux City, Ia.
 Schieffelin, Wm. J., New York, N. Y.
 Schleussner, Chas. F., Brooklyn, N. Y.
 *Schlotterbeck, J. O., Ann Arbor, Mich.
 Schrader, Aug., Baltimore, Md.,
 *Schuh, Paul G., Cairo, Ill.
 *Schulze, Louis, Baltimore, Md.
 *Scoville, W. L., Boston, Mass.

LIST OF MEMBERS IN ATTENDANCE

Scott, Geo. T., Worcester, Mass.	Vanderkleed, Chas.
*Searby, Wm. M., San Francisco, Cal.	Vaughan, Parry V.
Sharp, A. P., Baltimore, Md.	Vordick, A. H., S.
*Sheppard, S. A. D., Boston, Mass.	Voss, Geo. W., Cl.
Shinn, Jas. T., Philadelphia, Pa.	Walbridge, C. P.,
Shoemaker, C. F., Philadelphia, Pa.	*Wanous, J. A., M.
Shoemaker, R. M., Philadelphia, Pa.	Warn, W. E., Key
*†Shull, C. M., Philadelphia, Pa.	Warner, W. R., Jr.
*Simms, G. G. C., Washington, D. C.	*Watson, H. K., V.
*Simpson, Wm., Raleigh, N. C.	Webb, Wm. H., P.
*Simson, Frank C., Halifax, N. S.	Webber, J. LeRoy.
*Sloan, Geo. W., Indianapolis, Ind.	Weidemann, C. A.,
Smith, Clarence P., Newark, N. J.	Weidemann, G. B.,
*†Smith, O. C., Baltimore, Md.	Wendel, H. E., Ph.
Smith, Theodric, Baltimore, Md.	Wescott, Wm. C., A.
Smith, Walter B., Philadelphia, Pa.	Westcott, Jas. W.,
Squibb, Chas. F., Brooklyn, N. Y.	*Whelpley, H. M.,
*Staehle, L. L., Newark, N. J.	Whitehead, E. T., S.
*Staudt, L. C., Aurora, Ill.	*Whitfield, Thos., C.
Stein, E. T. N., Jersey City, N. J.	Whitney, H. M., N.
Stein, J. H., Reading, Pa.	Wichelns, Fred'k, N.
*Steinmeyer, Wm. O., Carlinville, Ill.	*Wiegand, Thos. S.,
*Stevens, A. B., Ann Arbor, Mich.	Wilbert, M. I., Phila.
Stewart, A. W., New York, N. Y.	Wiley, H. W., Wasl.
Stiles, Henry L., Philadelphia, Pa.	Williams, M. P., Cha.
Stoddart, Thos., Buffalo, N. Y.	Williams, Jno. K., E.
Stone, C. G., New York, N. Y.	Willis, Henry, Quebe.
Straup, F. P., Philadelphia, Pa.	Wood, A. F., New F.
Stutzlen, F. C., Elizabeth, N. J.	*†Woodbury, Frank
*†Swadley, E. H., Wabash, Ind.	Woodworth, Chas. B.
Takamine, J., New York, N. Y.	*Wooten, Thos. V.,
*Taylor, M. H., Macon, Ga.	Wrench, H. E., Mon.
Thorn, H. P., Medford, N. J.	Wright, C. L., Webb.
*Turner, Adam, Orangeville, Can.	Wuensch, C., Newarl.
*Tuthill, F. P., Brooklyn, N. Y.	Young, Chas., Johnst.
*Uhlich, F. G., St. Louis, Mo.	Zoeller, Edw. V., Tar.

LIST OF NEW MEMBERS.

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|---|---|
| <p>Adams, Arthur E., Auburn, N. Y.
 Allen, Grafton C., Norfolk, Va.
 Allen, William H., Detroit, Mich.
 Andreen, Carl, Sioux City, Ia.
 Anglum, John, Denver, Colo.
 Appelbaum, Jerome, Pueblo, Colo.
 Baer, Jacob M., Philadelphia, Pa.
 Baker, Howard S., Sioux City, Ia.
 Barbot, Julian A., Charleston, S. C.
 Barrett, Charles L., Camden, N. J.
 Batt, Herman, Chicago, Ill.
 Battle, Orrin McR., Fulton, Ark.
 Beck, Henry M., San Francisco, Cal.
 Berger, Ernest, Tampa, Fla.
 Bernheim, Moses R., San Francisco, Cal.
 Bernstein, Michel, Shreveport, La.
 Bethea, Oscar W., Meridian, Miss.
 Boesewetter, Richard, St. Louis, Mo.
 Bolink, Elebertus, Seattle, Wash.
 Bond, Jackson N., Mt. Vernon, Ill.
 Bond, John B., Jr., Little Rock, Ark.
 Bonnette, J. V., Pollock, La.
 Bories, Emil, Seattle, Wash.
 Bostick, Elmer E., Philadelphia, Pa.
 Bowerman, Kenneth B., San Francisco, Cal.
 Boyken, John W., San Francisco, Cal.
 Bradham, Caleb D., New Bern, N. C.
 Brewer, Howard D., Worcester, Mass.
 Brown, Charles M., Cleveland, O.
 Brucker, Carl, New York, N. Y.
 Burke, William H., Detroit, Mich.
 Burnett, George G., San Francisco, Cal.
 Burton, John C., Stroud, Okla.
 Caldwell, Joseph F., Allegheny City, Pa.
 Campbell, Albert A., St. Paul, Minn.
 Campbell, Charles B., Washington, D. C.
 Campbell, Milton, Philadelphia, Pa.
 Campbell, Theodore, Philadelphia, Pa.
 Capdau, Pierre A., New Orleans, La.
 Caspari, Charles E., St. Louis, Mo.
 Castlehun, Karl, Newburyport, Mass.
 Civins, Albert I., Philadelphia, Pa.</p> | <p>Clark, Alfred W., Denver, Colo.
 Cleveland, Jule M., Elberton, Ga.
 Colegaris, Joseph, San Francisco, Cal.
 Coleman, John H., Newark, N. J.
 Collins, Mary E., Miss, Westerly, R. I.
 Conger, Frederic A., St. Paul, Minn.
 Cooban, Benjamin S., Chicago, Ill.
 Cook, Alfred P., Portland, Me.
 Cookson, Joseph W., Kingman, Kan.
 Cornell, Edward C., Brookings, S. Dak.
 Crawford, Frank E., Providence, R. I.
 Cureton, George D., Gaffney, S. C.
 Daggett, Charles H., Providence, R. I.
 Dahlbender, George, San Francisco, Cal.
 Daly, James E., Stamford, Conn.
 Davidson, Edgar C., Dawson, Ga.
 Davies, John J., Scranton, Pa.
 Deemer, George M. H., Atlantic City, N. J.
 Dickman, Gustave A., St. Paul, Minn.
 Dillenback, Garrett V. d. V., Albany, N. Y.
 Dodds, Richard N., Springfield, Ill.
 Donnel, Cornelius P., Philadelphia, Pa.
 Drach, George L., Cleveland, O.
 Drake, Wallace C., Cleveland, O.
 Drechsler, Frank X., St. Paul, Minn.
 Drescher, August F., Newark, N. J.
 Drossel, August A., San Francisco, Cal.
 Dulaney, Joseph F., McKinney, Tex.
 Dunning, H. A. Brown, Baltimore, Md.
 Eaton, Harry E., Essex, Ia.
 Eaton, Harvey K., New York, N. Y.
 Eckert, John, Newark, N. J.
 Eigelberner, Harry B., Philadelphia, Pa.
 Elderdice, William J., Cumberland, Md.
 Elkin, William S., Jr., Atlanta, Ga.
 Eppstein, Jacob, Philadelphia, Pa.
 Evans, George B., Philadelphia, Pa.
 Famulener, Lemuel W., Detroit, Mich.
 Fenner, Harvey A., Philadelphia, Pa.
 Fischer, Henry J., Cleveland, O.
 Fisher, Dora C., Miss, Leavenworth, Kan.
 Fisk, Frank E., Chicago, Ill.</p> |
|---|---|

- Ford, Edgar F., Pueblo, Colo.
 Forsyth, William K., Chicago, Ill.
 Foster, J. Webb, Baltimore, Md.
 Fry, Herman, Chicago, Ill.
 Fulton, Peter M., Gayville, S. Dak.
 Gable, Ralph B., New York, N. Y.
 Gahn, Henry, New York, N. Y.
 Gamer, Albert C. C., Tacoma, Wash.
 Garrett, Oscar N., Hillsboro, O.
 Geddis, Frank, Washington, D. C.
 Gettel, Ralph, East Lansdowne, Pa.
 Gibbard, George E., Toronto, Ont.
 Gilbert, Robert B., Greenville, Ga.
 Gordon, Jean, Chicago, Ill.
 Gove, David M., San Francisco, Cal.
 Graham, Willard, Philadelphia, Pa.
 Grant, Isaac, San Francisco, Cal.
 Green, Samuel L., Camden, Ark.
 Haddad, Saleem F., New York, N. Y.
 Haines, Walter S., Augusta, Ga.
 Haley, John B., New Castle, Pa.
 Hall, Alden T., St. Paul, Minn.
 Hall, Frank M., Denver, Colo.
 Hall, Lincoln G., Coggon, Ia.
 Hamilton, William C., Bridgeport, Conn.
 Hance, Anthony M., Philadelphia, Pa.
 Hankey, William T., Cleveland, O.
 Harbaugh, Duncan J., Haverford, Phila., Pa.
 Hartigan, Joseph D., Bridgeport, Conn.
 Harting, Rudolph R., Lexington, Ky.
 Hartz, Johann D. A., College Point, N. Y.
 Hatcher, Robert A., Cleveland, O.
 Haydock, Mabelle, Miss, Philadelphia, Pa.
 Hays, Francis B., Atlanta, Ga.
 Heim, William J., Philadelphia, Pa.
 Heinritz, Lebrecht G., Holyoke, Mass.
 Henkel, Alice, Washington, D. C.
 Henkel, Charles B., Annapolis, Md.
 High, Raymond L., Philadelphia, Pa.
 Hitchcock, George H., New York, N. Y.
 Hoffmann, George F., Pesotum, Ill.
 Hoffmann, Herman, Houston, Tex.
 Holsenderf, Benjamin E., Havana, Cuba.
 Holt, Edwin M., Memphis, Tenn.
 Hood, Reuben C., Atlanta, Ga.
 Horne, Warren W., Fayetteville, N. C.
 Hughes, Francis S., Philadelphia, Pa.
 Irvine, Darwin W., San Francisco, Cal.
 Johns, William G., Cleveland, O.
 Jones, Oscar W., Auburn, Me.
 Jorden, Henry A., Bridgeton, N. J.
 Jorgenson, Edward B., San Francisco, Cal.
 Junger, William F. F., Reinbeck, Ia.
 Kephart, Philip, Berrien Springs, Mich.
 Kline, Clarence M., Germantown, Phila., Pa.
 Kloster, Benjamin J., Sioux City, Ia.
 Koelle, Otto C., Sioux City, Ia.
 Kolsch, Julius, Leadville, Colo.
 Kosminsky, Leonce Joe, Baltimore, Md.
 Kuehne, Charles, Jersey City Heights, N. J.
 Land, Robert H., Jr., Augusta, Ga.
 Lehritter, George P., New York, N. Y.
 Leslie, William A., Morgantown, N. C.
 Lichthardt, George H. P., Sacramento, Cal.
 Lo Sardo, Antonio, Brooklyn, N. Y.
 Louis, Henry, Iowa City, Ia.
 Lunney, William J., Seneca, S. C.
 Luve, Frank A. A., Washington, D. C.
 MacFadden, Warren L., Detroit, Mich.
 Mack, George C., Bristol, S. Dak.
 Mares, Frank M., Chicago, Ill.
 Mariamson, Max, New York, N. Y.
 May, Louis, Brooklyn, N. Y.
 McAdams, Harry K., Lexington, Ky.
 McKenzie, Hugh H., Cleveland, O.
 McNair, John S., Ashland, Ore.
 Mentzer, Harvey H., Germantown, Phila., Pa.
 Mercer, William E., Barry, Ill.
 Metzger, Mathias C., Cairo, Ill.
 Michels, Victor C., Albion, Ill.
 Miller, Frederick J., Cleveland, O.
 Miller, Frederick W., Homestead, Ia.
 Minnick, William G., Allegheny, Pa.
 Monaghan, Thomas F., Philadelphia, Pa.
 Morris, George A., Fort Stanton, New Mex.
 Morris, Henry M., Detroit, Mich.
 Morrison, William W., Iowa City, Ia.
 Morse, Frank D., Portland, Me.
 Mutty, Walter C., Oldtown, Me.
 Nelson, Burt E., Binghamton, N. Y.
 Oetinger, Albert, Philadelphia, Pa.
 Ortiz, Miguel A., Havana, Cuba.
 Oster, Frank C., Cleveland, O.
 Osterlund, Otto W., Philadelphia, Pa.
 Paddock, Morris V., St. John, N. B., Can.
 Palmer, John D., Monticello, Fla.
 Parker, Frederick M., St. Paul, Minn.
 Peterson, John N., Bayonne, N. J.
 Pippert, Nicholas J., St. Louis, Mo.
 Placak, Harry, Cleveland, O.
 Poole, William E., Montpelier, Vt.
 Prall, Delbert E., Saginaw, Mich.
 Pringle, Jas. M., New York, N. Y.
 Pursel, Robert C., Philadelphia, Pa.

- Quigley, Richard L., Washington, D. C.
 Quin, Frank W., New Orleans, La.
 Ramsaur, David W., Palatka, Fla.
 Raubenheimer, Otto, Brooklyn, N. Y.
 Reeves, Sidney H., St. Paul, Minn.
 Reimann, George, Buffalo, N. Y.
 Rich, W. Pitt, Verona, N. J.
 Richardson, Edwin S., Marshall, Tex.
 Ridgway, William F., Atlantic City, N. J.
 Robinson, William J., New York, N. Y.
 Roe, J. Newton, Valparaiso, Ind.
 Roehrig, Albert M., Stapleton, Staten Is.,
 N. Y.
 Roeller, Edward F., Velasco, Tex.
 Rogers, Anthony C., Gloucester, Mass.
 Rogers, Edward, Cincinnati, O.
 Rosengarten, George D., Philadelphia, Pa.
 Rosenham, Charles J., Louisville, Ky.
 Rubl, Harry F., Manheim, Pa.
 Sanford, John F., Lewiston, Me.
 Sauvinet, Charles D., New Orleans, La.
 Schleussner, Charles F., Brooklyn, N. Y.
 Schlosser, Peter, Louisville, Ky.
 Schmidt, Charles, Baltimore, Md.
 Schumann, Otto G., Baltimore, Md.
 Schutz, Chris, Madison, S. Dak.
 Seaverns, Martha G., Miss, Cambridge,
 Mass.
 Seidel, John H., Biddeford, Me.
 Sharp, Sol A., San Francisco, Cal.
 Shoemaker, Clayton F., Philadelphia, Pa.
 Shrader, William E., Iowa City, Ia.
 Smallwood, W. Thornton, Chicago, Ill.
 Smith, Albert H., Philadelphia, Pa.
 Smith, Edward W., Williamsport, Pa.
 Smith, Francis M., Charleston, S. C.
 Smith, James A., Baltimore, Md.
 Smith, Walter V., Philadelphia, Pa.
 Spangler, Lewis C., Lewes, Del.
 Speer, Charles C., St. Augustine, Fla.
 Speissegger, Walter L., Charleston, S. C.
 Sprissler, Clara, Miss, Philadelphia, Pa.
 Stecher, Frederick W., Cleveland, O.
 Stein, Edward T. N., Jersey City, N. J.
 Stein, Jacob H., Reading, Pa.
 Stephenson, Charles W., Chicago, Ill.
 Stewart, Aaron W., New York, N. Y.
 Stier, Carl, Tampa, Fla.
 Stormes, John E., Lancaster, Ky.
 Stutzlen, Frank C., Elizabeth, N. J.
 Swain, Harry, Philadelphia, Pa.
 Swannell, Henry, Champaign, Ill.
 Teeters, Wilber J., Iowa City, Ia.
 Thelander, Chreston C., Sioux City, Ia.
 Thomas, Frank W., Webb City, Mo.
 Thompson, Edwin T., Sioux City, Ia.
 Thompson, Joseph, Sioux City, Ia.
 Thorburn, Albert D., Chicago, Ill.
 Tidball, James T., Brookings, S. Dak.
 Timberlake, Arthur, Indianapolis, Ind.
 Traynor, Charles F., Biddeford, Me.
 Troxel, Henry L., Baltimore, Md.
 Troxler, Robert F., Port Townsend, Wash.
 Turner, Adam, Orangeville, Ont., Can.
 Vanderkleed, Charles E., Philadelphia, Pa.
 Viallon, Paul L., Jr., White Castle, La.
 Warner, William R., Jr., Philadelphia, Pa.
 Watson, William, Jr., Utica, N. Y.
 Weakly, William S., York, Pa.
 Weidemann, George B., Philadelphia, Pa.
 Weiser, William P., Camden, N. J.
 West, Courtney H., St. Louis, Mo.
 Whipple, George H., Bridgeton, N. J.
 White, Charles H., New York, N. Y.
 Wilbert, Martin I., Philadelphia, Pa.
 Wiley, Harvey W., Washington, D. C.
 Willard, Rowland, Haddonfield, N. J.
 Williams, Morrison P., Charlotte, N. C.
 Wilson, Oscar H., Philadelphia, Pa.
 Witting, Frederick F., Denver, Colo.
 Wolcott, Frank E., Indianapolis, Ind.
 Wrench, Henry E., Jr., Montclair, N. J.
 Young, Charles, Johnstown, Pa.
 Zabaldano, Alexander, San Francisco, Cal.

LIST OF LIFE MEMBERS.

PUBLISHED IN ACCORDANCE WITH RESOLUTIONS OF THE COUNCIL.

SEE PROCEEDINGS, 1888, PAGE 41.

[Names of Life Members under the Old Constitution in *Italics*; under the present By-Laws, in SMALL CAPITALS.]

Abernethy, Maxwell.
 BALLARD, JOHN W.
Bartlett, N. Gray.
 BAUER, LOUIS G.
Best, John.
 BIROTH, HENRY.
 BLAKE, JAMES E.
 BORING, EDWIN M.
 CANDIDUS, PHILIP C.
 CANNING, HENRY.
 CARRELL, EUGENE A.
Colton, James B.
Crossman, George A.
Dearborn, George L.
DeForest, W. P.
 DIEHL, C. LEWIS.
 DOHME, CHAS. E.
 DOHME, LOUIS.
Doliber, Thomas.
 DRAKE, JOHN R.
 DRURY, LINUS D.
 EBERT, ALBERT E.
Eckford, Joseph W.
 ELLIOTT, HENRY A.
Ellis, Evan T.
 EMICH, COLUMBUS V.
 FISH, CHAS. F.
 FUGERA, EDMUND C. H.
 FULLER, OLIVER F.
Gale, Edwin O.
Gale, William H.
 GEORGE, CHAS. T.
Goodwin, Wm. W.
Gordon, Wm. J. M.
 GROSSKLAUS, JOHN F.
 HANCE, EDWARD H.
 HANCOCK, JOHN F.
 HARLOW, NOAH S.

Harrington, Frank.
Heintzelman, Joseph A.
Heyl, James B.
 HOLMES, CLAY W.
 HOLZHAUER, CHARLES.
 JACQUES, GEORGE W.
James, F. L.
Jenks, Wm. J.
Jesson, Jacob.
Kent, Robert R.
 KING, JAMES T.
 KLUSSMANN, HERMANN.
 KRAEMER, HENRY.
 LAND, ROBERT H.
 LEE, JAMES A.
 LEIS, GEORGE.
 LEMBERGER, JOSEPH L.
 LEWELLYN, JOHN F.
 LLOYD, JOHN URI.
 MAIN, THOMAS F.
McPherson, George.
Mellor, Alfred.
 MEYER, CHRISTIAN F. G.
 MILHAU, EDWARD L.
 MILLER, ADOLPHUS W.
Moith, Augustus T.
Molwitz, Ernest.
 MOORE, GEORGE.
 MOORE, JOACHIM B.
 MORRIS, LEMUEL I.
 NEWMAN, GEORGE A.
 OHLIGER, LEWIS P.
Ollis, James H.
 ORNE, JOEL S.
 OWENS, RICHARD J.
Patten, I. Bartlett.
Patterson, Theo. H.
 PETITT, HENRY M.

PORTER, HENRY C.
 POWER, FREDERICK B.
 PRESCOTT, ALBERT B.
Rano, Charles O.
 RAMSPERGER, GUSTAVUS.
 REMINGTON, JOSEPH P.
Rittenhouse, Henry N.
 ROBINSON, JAMES S.
Rollins, John F.
 RUMSEY, SAM'L L.
 SANDER, ENNO.
 SARGENT, EZEKIEL H.
 SAUNDERS, WILLIAM.
 SCHEFFER, HENRY W.
 SEABURY, GEORGE J.
Sharp, Alpheus P.
 SHEPPARD, SAMUEL A. D.
 SHINN, JAMES T.
 SHURTLEFF, ISRAEL H.
 SIMMS, GILES G. C.

SKELLY, JAMES J.
Snyder, Ambrose G.
 STACEY, BENJAMIN F.
 STEELE, JAMES G.
Sweeney, Robert O.
Thompson, William B.
Vernor, James.
Viallon, Paul L.
 VOISS, ARCADIUS.
 WAUGH, GEORGE J.
 WELLCOME, HENRY S.
 WHELPLEY, HENRY M.
 WHITFIELD, THOMAS.
 WHITNEY, HENRY M.
Wiegand, Thomas S.
 WILSON, BENJAMIN O.
 WINKELMANN, JOHN H.
 WINTER, JONAS.
 WOLTERS DORF, LOUIS.
 YORSTON, MATTHEW M.

NOTE.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings 1900, p. 18.)

LIST OF MEMBERS WHO HAVE DIED SINCE THE ORGANIZATION OF THE A. PH. A. IN 1852.*

		Elected.	Died.
Adams, Hazen W.,	Hackensack, N. J.,	1879	1888
Adolph, Albert,	Columbus, O.,	1882	1883
Ahlbrandt, Henry F.,	St. Louis, Mo.,	1877	1895
Aimar, Geo. W.,	Charleston, S. C.,	1874	1877
Aird, Wm.,	Jacksonville, Fla.,	1887	1899
Albrecht, Emil,	Tamaqua, Pa.,	1875	1885
Alexander, Maurice W.,	St. Louis, Mo.,	1871	1897
Alfreds, Henry J.,	Providence, R. I.,	1883	1894
Anderson, Chas. B.,	Rockport, Ind.,	1891	1897
Anderson, Jas. H.,	New York, N. Y.,	1859	1866
Andrews, Geo. W.,	Baltimore, Md.,	1856	1877
Appleton, H. K.,	Boston, Mass.,	1887	1890
Argenti, Jerome J. B.,	San Francisco, Cal.,	1893	1903
Arnold, Chas. F.,	Sioux City, Iowa,	1891	1901
Ash, Matthew F.,	Jackson, Miss.,	1856	1893
Aspinwall, Jas. S.,	New York, N. Y.,	1855	1874
Atwood, Chas. H.,	Boston, Mass.,	1856	1877
Atwood, Hermon W.,	New York, N. Y.,	1873	1897
Babo, Leopold,	Boston, Mass.,	1859	1892
Bache, Chas. L.,	San Francisco, Cal.,	1852	1854
Bache, Franklin,	Philadelphia, Pa.,	1857	1864
Backus, Jas. W.,	Marine City, Mich.,	1867	1870
Badger, Chas. W.,	Newark, N. J.,	1870	1877
Bailey, Montgomery J.,	New York, N. Y.,	1856	1873
Baker, G. M.,	Brooklyn, N. Y.,	1880	1886
Baker, Walter T.,	Philadelphia, Pa.,	1885	1890
Bakes, Wm. C.,	Philadelphia, Pa.,	1864	1886
Balluff, Paul,	New York, N. Y.,	1870	1890
Balmer, Jas.,	Baltimore, Md.,	1856	1866
Barbot, Julian A.,	Charleston, S. C.,	1902	1903
Barry, John W.,	Baltimore, Md.,	1856	1861
Bassett, Francis M.,	Brooklyn, N. Y.,	1860	1885
Bassett, Joseph,	Salem, N. J.,	1880	1891
Bastin, Edson S.,	Philadelphia, Pa.,	1895	1897
Baxley, J. Brown,	Baltimore, Md.,	1856	1896
Bayley, Aug. R.,	Cambridgeport, Mass.,	1859	1899
Baylis, Wm. E. P.,	Brooklyn, N. Y.,	1860	1872
Baynou, John,	Shreveport, La.,	1858	1862
Beam, Isaac R.,	Baltimore, Md.,	1873	1879

* This list is complete up to February 20, 1903.

		Elected.	Died.
Bedford, P. W.,	New York, N. Y.,	1859	1892
Bell, Alexander C.,	Chicago, Ill.,	1879	1881
Bell, Gotthold E.,	Louisville, Ky.,	1874	1879
Bell, John I.,	Chicago, Ill.,	1890	1895
Bendiner, Sam'l J.,	New York, N. Y.,	1882	1897
Benedict, Jas. J.,	Cleveland, O.,	1882	1884
Benedict, Willis,	New Haven, Conn.,	1882	1889
Benjamin, Jas. H.,	New York, N. Y.,	1878	1892
Bentley, Rob't (Hon.),	London, England,	1872	1893
Benzinger, John S.,	Baltimore, Md.,	1860	1869
Berrian, Geo. W.,	Andover, Mass.,	1857	1898
Bertolett, Wm. J.,	Shreve, O.,	1872	1877
Betts, Howard S.,	Norwalk, Conn.,	1880	1883
Biddle, Herbert J.,	Lane, O.,	1888	1896
Bidwell, Marshall S.,	Elmira, N. Y.,	1871	1877
Bigelow, Francis O.,	Medford, Mass.,	1859	1863
Billings, Sam'l J.,	New York, N. Y.,	1860	1865
Bingham, John C.,	St. Johnsbury, Vt.,	1853	1870
Bissell, Emery G.,	Waterville, N. J.,	1879	1891
Blackman, Aug.,	New York, N. Y.,	1893	1896
Blackman, Lyman R.,	Newport, R. I.,	1865	1886
Blahnik, Lorenz,	Chicago, Ill.,	1881	1888
Blair, Henry C.,	Philadelphia, Pa.,	1855	1862
Blanding, Wm. B.,	Providence, R. I.,	1875	1892
Blatchford, Eben,	Rockport, Mass.,	1857	1896
Blauw, Hippolytus A.,	Rochester, N. Y.,	1856	1870
Blestren, Hans M. G.,	Eau Claire, Wis.,	1889	1897
Blunt, Ira W.,	Richmond, Va.,	1873	1886
Bocking, Edmund,	Wheeling, W. Va.,	1874	1895
Bond, Joseph R.,	New York, N. Y.,	1876	1885
Borrell, Godfrey,	New Orleans, La.,	1891	1893
Boullay, Pierre F. G. (Hon.),	Paris, France,	1868	1869
Bower, Henry,	Philadelphia, Pa.,	1860	1896
Bowker, Jas.,	Philadelphia, Pa.,	1876	1888
Bowman, Henry K.,	Philadelphia, Pa.,	1869	1873
Boyden, Ashel,	Boston, Mass.,	1853	1877
Brady, Henry B. (Hon.),	Newcastle-on-Tyne, Eng.,	1871	1891
Bray, Thos. W.,	Wingham, Ont.,	1881	1882
Brewer, Wm. A.,	Boston, Mass.,	1852	1890
Bright, Jas. E.,	Worcester, Mass.,	1868	1872
Bringhurst, Ferris,	Wilmington, Del.,	1862	1871
Bristol, Chas. E.,	Ansonia, Conn.,	1880	1892
Brooks, Francis M.,	Baton Rouge, La.,	1879	1891
Brown, Albert P.,	Camden, N. J.,	1870	1892
Brown, John T.,	Boston, Mass.,	1853	1862
Brown, Robt. J.,	Leavenworth, Kan.,	1862	1897
Brown, Wm.,	Boston, Mass.,	1858	1875
Brunnengraeber, Rudolf J. C. (Hon.),	Rostock, Germany,	1882	1893
Buck, Geo.,	Chicago, Ill.,	1860	1889
Buck, John,	Chelsea, Mass.,	1855	1899
Buffington, Cyrus A.,	Indianola, Ia.,	1880	1887

MEMBERS WHO HAVE DIED SINCE THE ORGANIZATION.

I I I I

		Elected.	Died.
Bullock, Chas.,	Philadelphia, Pa.,	1857	1900
Bunting, S. S.,	Philadelphia, Pa.,	1857	1890
Burdge, Jacob W.,	New York, N. Y.,	1876	1886
Burgess, Wm. C.,	Newport News, Va.,	1898	1901
Burnett, Joseph,	Boston, Mass.,	1852	1894
Bush, Wm.,	Worcester, Mass.,	1875	1894
Butler, P. H.,	Vernal, Utah,	1892	1892
Calder, Albert L.,	Providence, R. I.,	1859	1899
Cameron, Donald L.,	Rutherford, N. J.,	1897	1900
Campbell, John G.,	Corsicana, Tex.,	1878	1885
Campbell, Samuel,	Philadelphia, Pa.,	1864	1892
Campbell, Wm. P.,	Cumberland, Md.,	1879	1884
Canavan, Benj.,	New York, N. Y.,	1855	1857
Carle, John, Jr.,	New York, N. Y.,	1860	1888
Carney, Chas. T.,	Boston, Mass.,	1853	1862
Carter, Solomon,	Boston, Mass.,	1865	1892
Caspari, Chas.,	Baltimore, Md.,	1856	1870
Casselmann, Arthur (Hon.),	St. Petersburg, Russia,	1868	1872
Catlin, Thereon,	St. Louis, Mo.,	1871	1880
Chabot, David P.,	Jewett City, Conn.,	1895	1902
Chamberlain, Guilford T.,	St. Louis, Mo.,	1853	1892
Chapin, Fred. H.,	Hartford, Conn.,	1880	1900
Chapman, Wm. B.,	Cincinnati, O.,	1852	1874
Cherot, Leonce,	Memphis, Tenn.,	1865	1879
Chevalier, Alphonse (Hon.),	Paris, France,	1871	1879
Christiani, Chas. J. K.,	Washington, D. C.,	1874	1899
Christie, Jas.,	New York, N. Y.,	1893	1896
Churchill, Geo. W.,	Chelsea, Mass.,	1865	1869
Clency, Wm. F.,	Cincinnati, O.,	1859	1865
Close, Geo. C.,	Brooklyn, N. Y.,	1858	1891
Coddington, Isaac,	New York, N. Y.,	1855	1874
Coffin, S. L.,	New Westminster, Br. Col.,	1879	1887
Coggeshall, Geo. W.,	New York, N. Y.,	1852	1891
Colby, Moses D.,	Boston, Mass.,	1859	1870
Colcord, Sam'l M.,	Dover, Mass.,	1852	1895
Conrath, Adam,	Milwaukee, Wis.,	1881	1901
Cook, Geo. E.,	Port Jervis, N. Y.,	1872	1890
Coombs, Chas. C.,	Boston, Mass.,	1897	1902
Coon, J. V. D.,	Olean, N. Y.,	1880	1897
Coon, Walter S.,	New York, N. Y.,	1858	1861
Coppuck, Peter V.,	Mount Holly, N. J.,	1857	1869
Cotton, Wm. H.,	Newport, R. I.,	1885	1900
Covell, Thos. J.,	Rock Island, Ill.,	1864	1885
Crawford, Wm. H.,	St. Louis, Mo.,	1864	1885
Crawley, Francis X.,	St. Louis, Mo.,	1869	1882
Cressler, Chas. H.,	Chambersburg, Pa.,	1868	1890
Cressman, Noah,	Waterloo, Can.,	1863	1864
Cummings, Henry T.,	Tacoma, Wash.,	1853	1901
Cunningham, Jas. E.,	Pittsburg, Pa.,	1860	1863
Currie, John H.,	New York, N. Y.,	1858	1888
Curtman, Chas. O.,	St. Louis, Mo.,	1871	1896

		Elected.	Died.
Cushman, Alexander,	New York, N. Y.,	1858	1861
Cutler, E. Waldo,	Boston, Mass.,	1859	1896
Dadd, John A.,	Milwaukee, Wis.,	1880	1895
Daggett, Alfred, Jr.,	New Haven, Conn.,	1865	1878
Dale, Wm. M.,	Chicago, Ill.,	1880	1887
Dalrymple, Chas. H.,	Norristown, N. J.,	1860	1882
Daniels, S. O.,	Natick, Mass.,	1875	1888
Davies, Robt. J.,	Brooklyn, N. Y.,	1858	1872
Deane, Henry (Hon.),	London, Eng.,	1868	1874
Dejan, John B. G.,	New Orleans, La.,	1891	1899
Délondre, Aug. A.,	Sèvres, France,	1871	1885
De Motte, Henry A.,	Jersey City, N. J.,	1871	1873
De Vrij, J. E. (Hon.),	The Hague, Netherlands,	1871	1898
D'Evers, Henry G.,	Chicago, Ill.,	1865	1870
Dick, Dundas,	New York, N. Y.,	1879	1893
Dikeman, Nathan,	Waterbury, Conn.,	1859	1890
Dodge, John P.,	New York, N. Y.,	1855	1863
Dohmen, Peter L.,	Milwaukee, Wis.,	1884	1887
Dover, Thos.,	Dayton, O.,	1879	1881
Dragendorff, Geo. (Hon.),	Rostock, Germany,	1868	1898
Drake, Chas. W.,	Middleboro, Mass.,	1873	1894
Dreher, Ernest,	Newark, N. J.,	1869	1885
Drischler, Francis,	New York, N. Y.,	1881	1882
Duflos, Adolph (Hon.),	Annaberg, Germany,	1871	1889
Dunk, Alfred A.,	East Saginaw, Mich.,	1867	1879
Du Puy, Eugene,	Detroit, Mich.,	1852	1901
Durand, Elias (Hon.),	Philadelphia, Pa.,	1857	1873
Dyche, D. R.,	Chicago, Ill.,	1892	1893
Earnshaw, W. J.,	Cambridge City, Ind.,	1881	1887
Easterbrook, Ray B.,	New York, N. Y.,	1858	1868
Eger, Geo.,	Cincinnati, O.,	1864	1900
Eggers, Fred. H.,	Allegheny, Pa.,	1872	1900
Ekstrand, John P.,	Bridgeport, Kan.,	1888	1889
Ellis, Chas.,	Philadelphia, Pa.,	1852	1873
Emanuel, Louis M.,	Linwood, Pa.,	1857	1868
Erben, John S.,	Philadelphia, Pa.,	1868	1881
Evans, H. Sugden,	Montreal, Can.,	1880	1886
Everson, John C.,	Philadelphia, Pa.,	1863	1872
Eyster, Christopher E.,	Yankton, Dak.,	1871	1877
Faber, John,	New York, N. Y.,	1857	1881
Farlow, John B.,	Salt Lake City, Utah,	1889	1896
Farrington, Thos. (Hon.),	Boston, Mass.,	1856	1867
Faust, Chas.,	Cincinnati, O.,	1879	1886
Fennel, Adolphus,	Cincinnati, O.,	1864	1884
Fish, Geo. B.,	Saratoga Springs, N. Y.,	1860	1866
Fish, Henry F.,	New York, N. Y.,	1852	1868
Flückiger, F. A. (Hon.),	Berne, Switzerland,	1868	1894
Foley, Jas. T.,	Houston, Tex.,	1878	1879
Folger, Wm. S.,	Boston, Mass.,	1875	1878
Fougera, Chas. E.,	Brooklyn, N. Y.,	1867	1889
Forester, Richard,	Brooklyn, N. Y.,	1860	1862

		Elected.	Died.
Fowle, Henry D.,	Boston, Mass.,	1853	1882
Fox, Dan'l S.,	Reading, Pa.,	1872	1893
French, Wm. B.,	Albany, N. Y.,	1880	1892
Frey, John,	New York, N. Y.,	1865	1884
Frohwein, Max,	New York, N. Y.,	1865	1877
Frohwein, Theobald,	New York, N. Y.,	1862	1883
Frost, John J.,	Lexington, Ky.,	1874	1880
Fuller, Henry W.,	New York, N. Y.,	1865	1892
Fulton, John C. P.,	Brooklyn, N. Y.,	1873	1874
Gabaudan, Arthur W.,	New York, N. Y.,	1862	1870
Gaither, Francis S.,	Washington, D. C.,	1860	1876
Gallagher, Chas. K.,	Washington, N. C.,	1857	1896
Garrigues, Sam'l S.,	Ann Arbor, Mich.,	1855	1889
Gay, Wm.,	Cambridgeport, Mass.,	1858	1862
Gaylord, Henry C.,	Cleveland, O.,	1869	1893
Geiger, Conrad J.,	Canton, O.,	1866	1876
Gellatly, Wm. A.,	New York, N. Y.,	1858	1885
Gerhard, John E.,	Cincinnati, O.,	1862	1866
Geyer, Andrew,	Boston, Mass.,	1853	1855
Gibson, Jas. E.,	Little Rock, Ark.,	1887	1898
Giles, Wm. M.,	New York, N. Y.,	1888	1889
Gill, Geo.	Mt. Vernon, N. Y.,	1872	1901
Gille, Norbert (Hon.),	Brussels, Belgium,	1868	1899
Gilman, Sam'l K., Jr.,	Boston, Mass.,	1876	1879
Girling, Robt. N.,	Detroit, Mich.,	1876	1899
Gleeson, Jas. A.,	Boston, Mass.,	1859	1880
Gleeson, Michael H.,	Boston, Mass.,	1859	1879
Goebel, Edward,	Louisville, Ky.,	1884	1890
Goodman, Chas. F.,	Omaha, Neb.,	1871	1895
Goodrich, Stephen,	Hartford, Conn.,	1875	1892
Gosman, Adam J.,	Baltimore, Md.,	1870	1901
Gracfe, Fred. A.,	Baltimore, Md.,	1870	1873
Grahame, Israel J.,	Philadelphia, Pa.,	1856	1899
Green, Thos. T.,	Poughkeepsie, N. Y.,	1858	1880
Greenish, Thos. (Hon.),	London, Eng.,	1882	1899
Gregory, Edmund,	Lindsay, Ont., Can.,	1875	1892
Greve, Theodore L. A.,	Cincinnati, O.,	1864	1898
Gridley, Junius,	New York, N. Y.,	1853	1886
Griffith, Albert R.,	New York, N. Y.,	1870	1897
Griffith, Hiram E.,	Niagara Falls, N. Y.,	1875	1889
Griswold, Wm. H.,	North Adams, Mass.,	1874	1879
Groneweg, Louis,	Cincinnati, O.,	1864	1866
Habliston, Chas. C.,	Baltimore, Md.,	1894	1896
Haddox, Jas. B.,	Nashville, Tenn.,	1876	1880
Haenchen, Chas. E.,	Philadelphia, Pa.,	1865	1894
Hager, Hermann H. J. (Hon.),	Frankfort, Germany,	1868	1897
Hair, Joseph C.,	Wilkesbarre, Pa.,	1881	1884
Hale, Fred.,	Boston, Mass.,	1855	1892
Hall, Chas. K.,	New Orleans, La.,	1887	1894
Halleck, Wm. E.,	Washington, D. C.,	1890	1897
Hamilton, Claude C.,	Kansas City, Mo.,	1893	1896

		Elected.	Died.
Hammel, Joseph,	Medford, Wis.,	1889	1901
Hanbury, Dan'l (Hon.),	London, Eng.,	1868	1875
Hancock, John H.,	Baltimore, Md.,	1870	1900
Harbaugh, Valentine,	Washington, D. C.,	1856	1871
Hardy, Wm. H.,	Clinton, Ia.,	1881	1884
Hartwig, Chas. F.,	Chicago, Ill.,	1881	1899
Harwood, Lucien,	Warren, Mass.,	1875	1883
Hassencamp, Ferd.,	Baltimore, Md.,	1872	1885
Hartshorn, Fred'k A.,	Marlborough, Mass.,	1880	1902
Hattenhauer, Robt. C., Jr.,	La Salle, Ill.,	1881	1897
Haviland, Henry,	Brooklyn, N. Y.,	1857	1902
Hawkins, Henry,	Detroit, Mich.,	1880	1890
Hay, Henry H.,	Portland, Me.,	1867	1895
Hazard, Peter J.,	Philadelphia, Pa.,	1853	1876
Hegeman, Fred. A.,	New York, N. Y.,	1855	1860
Hegeman, J. Niven,	New York, N. Y.,	1880	1895
Hegeman, Wm.,	New York, N. Y.,	1858	1875
Heinemann, Otto,	Cincinnati, O.,	1864	1901
Heinitsh, Chas. A.,	Lancaster, Pa.,	1857	1898
Heller, Ludwig,	Chicago, Ill.,	1884	1885
Heuchman, Dan'l,	Boston, Mass.,	1853	1878
Hendel, Sam'l D.,	St. Louis, Mo.,	1858	1871
Henes, Wm. F.,	Bay City, Mich.,	1876	1892
Hensch, Hugo,	Cleveland, O.,	1872	1873
Hermann, Fred. F.,	San José, Costa Rica,	1888	1892
Heschong, John F.,	Peoria, Ill.,	1896	1902
Heydenreich, Fred. V.,	Brooklyn, N. Y.,	1860	1879
Heyerdahl, Ulrich,	Faribault, Minn.,	1880	1882
Higgins, Jas. S.,	New York, N. Y.,	1862	1896
Hill, Henry E.,	Detroit, Mich.,	1866	1868
Hoagland, Pratt R.,	Boston, Mass.,	1867	1882
Hodge, Chas.,	Portland, Ore.,	1859	1881
Hohenthal, Chas. F. L.,	New York, N. Y.,	1865	1890
Hohley, Chas.,	Toledo, O.,	1872	1896
Hollis, Thos.,	Boston, Mass.,	1853	1875
Holzhauser, Gus.,	Newport, Ky.,	1893	1895
Homann, Jas. W.,	New York, N. Y.,	1875	1875
Hoskinson, J. Thos., Jr.,	Philadelphia, Pa.,	1881	1893
Hottendorf, Aug. W.,	Cincinnati, O.,	1864	1884
Howard, Geo. M.,	Washington, D. C.,	1871	1877
Howarth, Jas. L.,	Atlanta, Ga.,	1877	1881
Howey, John J.,	Montreal, Can.,	1896	1900
Howson, Walter H.,	Chillicothe, O.,	1875	1894
Hudnut, Alex.,	New York, N. Y.,	1857	1900
Hughes, Henry A.,	Louisville, Ky.,	1857	1876
Huling, Bruce,	Cleveland, O.,	1873	1883
Hunt, Henry H.,	Balston Spa, N. Y.,	1876	1877
Hunt, Jas. L.,	Hingham, Mass.,	1865	1884
Ihlefeld, Conrad S.,	New York, N. Y.,	1881	1895
Ingalls, John,	Macon, Ga.,	1876	1898
Ink, Parker P.,	Orlando, Fla.,	1888	1892

		Elected.	Died.
James, Thos. P.,	Cambridge, Mass.,	1857	1882
Jardella, Jerome B.,	Vincennes, Ind.,	1865	1870
Jenkins, Wm. E.,	Boston, Mass.,	1865	1869
Jennings, N. Hynson,	Baltimore, Md.,	1857	1896
John, Fred. L.,	Philadelphia, Pa.,	1856	1864
Johnson, Chas. P.,	Memphis, Tenn.,	1868	1873
Johnson, John,	New Orleans, La.,	1887	1892
Johnston, Wm.,	Detroit, Mich.,	1860	1888
Jones, Dan'l S.,	Philadelphia, Pa.,	1859	1893
Jones, Edwin C.,	Media, Pa.,	1864	1895
Jones, John, Jr.,	Gold Hill, Nev.,	1889	1895
Jones, S. S.,	Wilkesbarre, Pa.,	1887	1894
Jones, Thos.,	Brooklyn, N. Y.,	1868	1889
Jordan, Wm. H.,	Boston, Mass.,	1871	1891
Judge, John F.,	Cincinnati, O.,	1866	1891
Junghanns, Chas. A.,	Cincinnati, O.,	1858	1862
Kadlec, Lawrence W.,	Chicago, Ill.,	1880	1896
Kalb, Theodore,	St. Louis, Mo.,	1864	1882
Kaltwasser, Aug. P.,	St. Louis, Mo.,	1901	1902
Karch, Jos. J.,	Lebanon, Pa.,	1876	1886
Keeler, Wm. H.,	Saginaw City, Mich.,	1872	1891
Keffer, Fred. A.,	New Orleans, La.,	1862	1873
Kelley, Gilliam J.,	Atlanta, Ga.,	1894	1897
Kelsey, Henry, Jr.,	New Haven, Conn.,	1873	1883
Kemp, Edward,	New York, N. Y.,	1888	1901
Kendrick, Harlan P.,	Barre, Vt.,	1894	1895
Kennedy, Ewen C.,	Jersey City, N. J.,	1888	1892
Kennedy, Geo. W.,	Pottsville, Pa.,	1869	1902
Kennedy, Robt. C.,	Cleveland, O.,	1865	1868
Kent, Ashbury,	Cincinnati, O.,	1854	1860
Kent, William,	Cincinnati, O.,	1864	1867
Kessler, Ed. F.,	Louisville, Ky.,	1879	1895
Kettell, Geo. P.,	Charlestown, Mass.,	1867	1881
Keys, Roger,	Philadelphia, Pa.,	1868	1890
Kidder, Darius B.,	Boston, Mass.,	1858	1874
Kidder, Sam'l,	Lowell, Mass.,	1859	1894
Kiersted, Henry T.,	New York, N. Y.,	1856	1882
King, Alexander,	Buffalo, N. Y.,	1874	1876
King, Henry,	New York, N. Y.,	1858	1867
King, Walter B.,	Waco, Tex.,	1883	1891
Kline, Benj. M.,	Denver, Colo.,	1889	1890
Knapp, Edwin E.,	Norwalk, Conn.,	1860	1862
Knight, Geo. E.,	Bath, N. Y.,	1880	1885
Knoebel, Edmund,	Highland, Ill.,	1882	1889
Knoefel, Aug. F.,	New Albany, Ind.,	1879	1894
Kochan, John,	Denver, Colo.,	1885	1899
Kolp, Christopher H.,	Philadelphia, Pa.,	1876	1878
Krebs, Hugo,	St. Louis, Mo.,	1871	1880
Krosscup, Wm. B.,	Oil City, Pa.,	1887	1894
Krummeck, Jacob,	Santa Fé, N. Mex.,	1867	1878
Kurfurst, Henry F.,	Dayton, O.,	1881	1897

		Elected.	Died.
Laidley, Joseph,	Richmond, Va.,	1852	1861
Laing, Alfred A.,	Cambridgeport, Mass.,	1888	1901
Lalmant, Eugene,	New Orleans, La.,	1891	1896
Lancaster, Thos. A.,	Philadelphia, Pa.,	1859	1875
Landerer, Francis X. (Hon.),	Athens, Greece,	1877	1885
Lane, Alfred S.,	Rochester, N. Y.,	1857	1881
Lane, Jas. B.,	Fitchburg, Mass.,	1856	1876
Last, Louis,	Moberly, Mo.,	1888	1897
Latimer, Robt. F.,	Jackson, Mich.,	1857	1888
Lauranson, Louis,	Memphis, Tenn.,	1894	1894
Lehlbach, Paul F.,	New York, N. Y.,	1872	1884
Leitch, Alex.,	St. Louis, Mo.,	1858	1868
Leonhard, E. Rudolph,	Paterson, N. J.,	1891	1898
Leuschner, Otto,	Detroit, Mich.,	1857	1868
Lewis, Thos.,	Brooklyn, N. Y.,	1867	1880
Lilly, Eli,	Indianapolis, Ind.,	1878	1898
Lincoln, Henry W.,	Charlestown, Mass.,	1853	1887
Lineaweaver, Kline C.,	Washington, D. C.,	1864	1873
Lingelbach, Ferd.,	Louisville, Ky.,	1874	1879
Little, Wm. B.,	Panama, U. S. Colombia,	1857	1867
Lobstein, Jacob F. D.,	Sag Harbor, N. Y.,	1868	1884
Longshaw, Wm., Jr.,	Bayou Sara, La.,	1858	1864
Louis, Leopold G.,	New York, N. Y.,	1897	1900
Luckenbach, Ed. H.,	Bethlehem, Pa.,	1870	1883
Ludwig, Hermann (Hon.),	Jena, Germany,	1871	1873
Luhn, Gustavus,	Charleston, S. C.,	1873	1888
Lyman, Asahel H.,	Manistee, Mich.,	1884	1890
Lyman, Benj.,	Montreal, Can.,	1875	1878
Lyman, Stephen J.,	Montreal, Can.,	1875	1879
Lyneman, F. A.,	Denver, Colo.,	1892	1894
Lyon, Chas. H., Jr.,	Boston, Mass.,	1858	1871
MacLagan, Henry,	New York, N. Y.,	1883	1894
Maisch, Henry C. C.,	Philadelphia, Pa.,	1885	1901
Maisch, John M.,	Philadelphia, Pa.,	1856	1893
Majer, Oscar,	Clinton, Ia.,	1880	1902
Mallinckrodt, Gus.,	St. Louis, Mo.,	1869	1877
Markoe, Geo. F. H.,	Boston, Mass.,	1863	1896
Marsh, Ed. H.,	New York, N. Y.,	1858	1884
Marshall, Rush P.,	Monrovia, Cal.,	1893	1898
Martin, Hugo W. C.,	Chicago, Ill.,	1881	1894
Martin, Stanislas (Hon.),	Paris, France,	1872	1887
Martin, Wm. J.,	Cincinnati, O.,	1881	1889
Martindale, Wm. (Hon.),	London, Eng.,	1898	1902
Masi, Fred. H.,	Norfolk, Va.,	1873	1890
Mason, Alfred H.,	New York, N. Y.,	1884	1896
Massot, Eugene L.,	St. Louis, Mo.,	1857	1871
Matt, Joseph,	Columbus, O.,	1872	1874
Mattern, Jonathan C.,	Pittsburg, Pa.,	1860	1870
Mattingly, Geo. J.,	New Orleans, La.,	1891	1895
Maxwell, Jas. T.,	New York, N. Y.,	1855	1860
May, Eugene,	New Orleans, La.,	1891	1901

		Elected.	Died.
Mayell, Alfred,	Cleveland, O.,	1872	1891
Mayer, Ferd. F.,	New York, N. Y.,	1859	1869
McAfee, John J.,	Mobile, Ala.,	1890	1898
McBride, Jas.,	St. Louis, Mo.,	1864	1871
McCarthy, C. J.,	Shenandoah City, Pa.,	1886	1891
McClure, Archibald,	Albany, N. Y.,	1880	1889
McConville, Michael S.,	Worcester, Mass.,	1859	1873
McDonald, John,	Brooklyn, N. Y.,	1860	1861
McElwee, Emer J.,	Mt. Pleasant, Pa.,	1888	1897
McIntyre, Timothy,	Washington, D. C.,	1858	1862
McKay, Geo. J.,	Eureka, Cal.,	1864	1880
McLean, Geo.,	Orrick, Mo.,	1894	1897
McLeod, Roderick,	Quebec, Can.,	1880	1888
McNeil, J. M.,	Scottdale, Pa.,	1882	1896
McPherson, Geo. B.,	Cincinnati, O.,	1867	1871
Meade, Richard H.,	Richmond, Va.,	1873	1880
Meakim, John,	New York, N. Y.,	1852	1863
Mellon, John J.,	New Orleans, La.,	1883	1892
Melvin, Jas. S.,	Boston, Mass.,	1853	1891
Melvin, Sam'l H.,	East Oakland, Cal.,	1889	1898
Melzar, Aug. P.,	Wakefield, Mass.,	1856	1874
Menard, Alex. A.,	Macon, Ga.,	1877	1881
Mennen, Gerhard,	Newark, N. J.,	1888	1902
Menninger, Henry J.,	Brooklyn, N. Y.,	1866	1890
Merrell, Wm. S.,	Cincinnati, O.,	1854	1882
Merrick, John M.,	Boston, Mass.,	1875	1879
Merrill, Chas. A.,	Exeter, N. H.,	1858	1886
Metcalf, Theodore,	Boston, Mass.,	1857	1894
Metcalf, Tristram W.,	Brooklyn, N. Y.,	1857	1873
Meyers, Ed. T.,	Bethlehem, Pa.,	1867	1885
Milburn, John A.,	Washington, D. C.,	1858	1895
Milburn, W. C.,	Washington, D. C.,	1883	1891
Milbau, John,	New York, N. Y.,	1855	1874
Miller, Jason A.,	Gloversville, N. Y.,	1879	1898
Mohr, Fred. (Hon.),	Bonn, Germany,	1868	1879
Moffit, Thos. S.,	San Francisco, Cal.,	1861	1901
Monsarrat, Oscar,	Baltimore, Md.,	1856	1887
Moore, J. Faris,	Baltimore, Md.,	1856	1888
Morgan, James,	Carl Junction, Mo.,	1859	1887
Mott, Wm.,	Saginaw City, Mich.,	1869	1883
Muller, Wm. H.,	Chicago, Ill.,	1865	1870
Mundy, Wm. C.,	Seneca Falls, N. Y.,	1880	1881
Munson, Jas. H.,	Philadelphia, Pa.,	1889	1894
Munson, Luzerne I.,	Waterbury, Conn.,	1872	1895
Muth, John P.,	Baltimore, Md.,	1864	1885
Nadand, Jas. W.,	Cincinnati, O.,	1864	1868
Nagle, Asher C.,	Youngstown, O.,	1881	1886
Nagle, John G.,	Baltimore, Md.,	1863	1869
Nairn, Joseph W.,	Washington, D. C.,	1858	1875
Neate, Wm. I. C.,	Olympia, W. T.,	1880	1881
Neergaard, John W.,	New York, N. Y.,	1859	1880

		Elected.	Died
Newman, Geo. A.,	Brooklyn, N. Y.,	1865	1895
Nicot, Louis E.,	Brooklyn, N. Y.,	1875	1880
Niebrugge, John A.,	Brooklyn, N. Y.,	1861	1891
Norgrave, Sam'l K.,	Pittsburg, Pa.,	1857	1871
Oberdeener, Moses,	Santa Clara, Cal.,	1880	1885
Oberdeener, Sam'l,	Santa Clara, Cal.,	1889	1900
O'Brien, Jas. J.,	Boston, Mass.,	1875	1802
O'Brien, Joseph C.,	Baltimore, Md.,	1863	1873
O'Gallagher, Jas.,	St. Louis, Mo.,	1858	1852
Oliffe, Wm. J.,	New York, N. Y.,	1858	1860
Osborn, Wm. H.,	Baltimore, Md.,	1870	1881
Osgood, Hugh H.,	Norwich, Conn.,	1875	1900
Osgood, Sam'l W.,	Davenport, Ia.,	1858	1860
Osmun, Chas. A.,	New York, N. Y.,	1868	1901
Oxley, Jefferson,	Nicholasville, Ky.,	1878	1885
Paine, Jas. D.,	Rochester, N. Y.,	1857	1897
Painter, Emlen,	New York, N. Y.,	1870	1890
Palmer, Albert G.,	Washington, D. C.,	1858	1860
Parker, Herschel,	Brooklyn, N. Y.,	1867	1870
Partridge, Chas. K.,	Augusta, Me.,	1867	1902
Parr, John C.,	Los Angeles, Cal.,	1856	1897
Parrish, Dillwyn,	Philadelphia, Pa.,	1870	1880
Parrish, Edward,	Philadelphia, Pa.,	1852	1870
Parsons, Henry B.,	New York, N. Y.,	1882	1885
Parsons, Robt. E.,	Orange, N. J.,	1877	1888
Patten, John F.,	Bangor, Me.,	1871	1881
Peabody, Wm. H.,	Buffalo, N. Y.,	1857	1902
Pease, Francis M.,	Lee, Mass.,	1880	1902
Peck, Serens P.,	Bennington, Vt.,	1853	1859
Peixotto, Moses L. M.,	New York, N. Y.,	1859	1800
Pennington, Thos. H. S.,	Saratoga, N. Y.,	1877	1900
Penrose, Stephen F.,	Quakertown, Pa.,	1871	1880
Perkins, Elisha H.,	Baltimore, Md.,	1857	1888
Perot, T. Morris,	Philadelphia, Pa.,	1857	1902
Pettis, Newton C.,	North Adams, Mass.,	1868	1874
Pfingst, Ed. C.,	Louisville, Ky.,	1874	1893
Pfingst, Ferd. J.,	Louisville, Ky.,	1867	1899
Philbrick, Sam'l P.,	Boston, Mass.,	1852	1859
Phillips, Lewellyn,	Baltimore, Md.,	1856	1865
Phillips, Walter F.,	Portland, Me.,	1859	1864
Physick, Henry S.,	St. Louis, Mo.,	1870	1801
Pile, Wilson H.,	Philadelphia, Pa.,	1857	1881
Planchon, Gus. (Hon.),	Paris, France,	1877	1900
Platzer, Robt.,	Philadelphia, Pa.,	1865	1874
Plummer, David G.,	Bradford, Ill.,	1869	1898
Plummer, Geo. B.,	Hinsdale, Mass.,	1875	1882
Polhemus, Jas. L.,	Sacramento, Cal.,	1866	1867
Pollard, Chas. P.,	Marysville, Cal.,	1859	1860
Porter, Henry C.,	Towanda, Pa.,	1869	1877
Powers, Chas. J.,	Syracuse, N. Y.,	1882	1883
Prentice, Fred. F.,	Janesville, Wis.,	1876	1895

		Elected.	Died.
Preston, Alfred J.,	Portland, Me.,	1873	1879
Preston, David,	Philadelphia, Pa.,	1868	1900
Priddy, R. S.,	Windsor, Ont., Can.,	1882	1884
Procter, Wm., Jr.,	Philadelphia, Pa.,	1852	1874
Pyle, Jas. L.,	Brooklyn, N. Y.,	1859	1866
Quayle, Thos. A.,	New Orleans, La.,	1897	1900
Raas, Francis,	Brooklyn, N. Y.,	1877	1884
Randall, Geo. D.,	St. Johnsbury, Vt.,	1875	1888
Rankin, Jesse W.,	Atlanta, Ga.,	1877	1892
Redwood, Theophilus (Hon.),	London, Eng.,	1871	1892
Reed, Isaac N.,	Toledo, O.,	1881	1891
Reed, Thomas D.,	Montreal, Can.,	1896	1900
Rehfuss, Lewis,	Cincinnati, O.,	1854	1856
Reifsnider, Wm. E.,	Baltimore, Md.,	1864	1872
Reinhold, Bernard H.,	New York, N. Y.,	1861	1875
Reinlein, Paul,	Washington, D. C.,	1856	1887
Restieaux, Thos.,	Boston, Mass.,	1853	1887
Reum, Herman F.,	Cincinnati, O.,	1864	1887
Reusch, Ernest,	Brooklyn, N. Y.,	1882	1890
Reynolds, Richard (Hon.),	Leeds, Eng.,	1882	1900
Rice, Chas.,	New York, N. Y.,	1870	1900
Ricker, Geo. D.,	Boston, Mass.,	1858	1881
Rickey, Randal,	Trenton, N. J.,	1870	1887
Rideout, Jas. W.,	Brooklyn, N. Y.,	1875	1880
Riley, Chas. W.,	Philadelphia, Pa.,	1868	1896
Ritson, Alfred,	Columbus, O.,	1870	1879
Robbins, Alonzo,	Philadelphia, Pa.,	1865	1896
Robbins, Chas. A.,	New York, N. Y.,	1876	1889
Robbins, Dan'l C.,	New York, N. Y.,	1862	1888
Roberts, David,	Boston, Mass.,	1858	1863
Roberts, Joseph,	Baltimore, Md.,	1856	1888
Robertson, Peter,	Newberry, S. C.,	1896	1900
Robinet, Stephane (Hon.),	Paris, France,	1868	1869
Robinson, Wm. S.,	Yorkville, Toronto, Can.,	1877	1889
Roemer, Dan'l,	Cincinnati, O.,	1865	1870
Rollmann, Fred.,	Philadelphia, Pa.,	1862	1864
Ronnefeld, Theodore,	Detroit, Mich.,	1866	1888
Rosengarten, Mitchell G.,	Philadelphia, Pa.,	1869	1898
Ross, Geo.,	Lebanon, Pa.,	1878	1880
Ruble, John B.,	Canton, Ill.,	1884	1886
Rudolf, Eliza (Mrs.),	New Orleans, La.,	1887	1897
Russell, Eugene J.,	Baltimore, Md.,	1856	1899
Rust, Wm.,	New Brunswick, N. J.,	1870	1895
Ryan, Henry,	Taftville, Conn.,	1892	1895
Sands, Jesse M.,	New York, N. Y.,	1860	1867
Sanford, Geo. W. (Hon.),	London, Eng.,	1882	1892
Sauer, Louis W.,	Cincinnati, O.,	1882	1901
Saunders, Rich. B.,	Chapel Hill, N. C.,	1858	1890
Sautter, Louis,	Albany, N. Y.,	1879	1897
Scala, Wm. F.,	Washington, D. C.,	1876	1885
Schacht, Geo. F. (Hon.),	Bristol, Eng.,	1882	1896

		Elected.	Died.
Scherff, John P.,	Bloomfield, N. J.,	1887	1901
Schiller, Wm. C.,	Baltimore, Md.,	1890	1891
Schmidt, Henry,	New York, N. Y.,	1874	1875
Schmidt, Wm. G.,	Louisville, Ky.,	1874	1877
Schrader, Henry,	Indianapolis, Ind.,	1869	1889
Schumacher, Albert C.,	Ann Arbor, Mich.,	1900	1902
Schumann, Theodore,	Atlanta, Ga.,	1860	1894
Scott, David,	Worcester, Mass.,	1855	1878
Scott, John,	Cincinnati, O.,	1854	1873
Scribner, John C.,	Angels' Camp, Cal.,	1889	1892
Scully, Harmar D.,	Pittsburg, Pa.,	1858	1866
Selfridge, Matthew M.,	Philadelphia, Pa.,	1858	1881
Sellers, Walter A.,	Chambersburg, Pa.,	1897	1898
Sennewald, F. W.,	St. Louis, Mo.,	1865	1899
Sewall, David J.,	Boston, Mass.,	1875	1889
Sheddon, John W.,	New York, N. Y.,	1856	1884
Sherwood, Louis W.,	Columbus, O.,	1882	1897
Shiels, Geo. E.,	New York, N. Y.,	1860	1894
Shoemaker, Joseph L.,	Philadelphia, Pa.,	1867	1880
Shriver, Henry,	Cumberland, Md.,	1876	1896
Sinimberghi, C. N. (Hon.),	Rome, Italy,	1882	1886
Sitton, Chas. E.,	Portland, Ore.,	1878	1890
Sleuman, Chas. A., Jr.,	Chelsea, Mass.,	1892	1897
Sloan, Geo. W.,	Indianapolis, Ind.,	1857	1903
Smalley, Elijah,	Boston, Mass.,	1860	1887
Smith, Auburn,	London, O.,	1880	1882
Smith, Chas. A.,	Cincinnati, O.,	1852	1862
Smith, Chas. B.,	Newark, N. J.,	1868	1902
Smith, Dan'l,	Philadelphia, Pa.,	1852	1883
Smith, Edward A.,	Baltimore, Md.,	1870	1875
Smith, Edwin R.,	Monmouth, Ill.,	1862	1869
Smith, Israel P.,	Newark, N. J.,	1876	1890
Smith, John W.,	Norfolk, Va.,	1873	1870
Smith, Sam'l A.,	Newburyport, Mass.,	1859	1874
Smith, Stephen D.,	Reading, Pa.,	1883	1889
Smither, Chas.,	Buffalo, N. Y.,	1881	1882
Snively, Andrew J.,	Hanover, Pa.,	1883	1890
Snowdon, Geo. M.,	Philadelphia, Pa.,	1857	1874
Soubeiran, J. L. (Hon.),	Montpelier, France,	1871	1892
Spannagel, Chas. C. A.,	Philadelphia, Pa.,	1874	1891
Spencer, Peter I.,	Cleveland, O.,	1872	1890
Squibb, Ed. R.,	Brooklyn, N. Y.,	1858	1900
Squire, Peter (Hon.),	London, Eng.,	1882	1884
Squire, Wm. H.,	Germantown, Pa.,	1862	1865
Stabler, Rich. H.,	Alexandria, Va.,	1856	1878
Stahler, Wm.,	Norristown, Pa.,	1880	1899
Stam, Colin F.,	Chestertown, Md.,	1882	1898
Steele, Henry,	San Francisco, Cal.,	1859	1892
Steiner, Henry,	Philadelphia, Pa.,	1857	1858
Stephen, Wm. G.,	Yonkers, N. Y.,	1860	1878
Stevens, Ashbel M.,	Cincinnati, O.,	1854	1880

MEMBERS WHO HAVE DIED SINCE T

Stevens, Rufus W.,	Somersworth, N. F.
Stoff, Louis F.,	New York, N. Y.,
Strassel, Wm.,	Louisville, Ky.,
Stryker, Cornelius W.,	Philadelphia, Pa.,
Suding, Henry A.,	Baltimore, Md.,
Sweet, Abel S.,	Bangor, Me.,
Sweet, Henry,	Chicago, Ill.,
Sweet, Wm. S.,	Warsaw, N. Y.,
Sweetser, Thos. A.,	South Danvers, Ma.
Talbot, Stephen L.,	Providence, R. I.,
Tanke, Ernest J.,	Chicago, Ill.,
Taylor, Alfred B.,	Philadelphia, Pa.,
Taylor, John P.,	New Bedford, Mass.,
Taylor, Robt. J.,	Newport, R. I.,
Taylor, Wm.,	Philadelphia, Pa.,
Test, A. W.,	Camden, N. J.,
Thayer, Henry,	Cambridge, Mass.,
Thibodeaux, Joseph G.,	Thibodaux, La.,
Thomas, Wm.,	Jersey City, N. J.,
Thompson, Wm. S.,	Baltimore, Md.,
Thompson, Wm. S.,	Washington, D. C.,
Thomsen, John J.,	Baltimore, Md.,
Tilden, Henry A.,	New Lebanon, N. Y.,
Tomfohrde, J. W.,	St. Louis, Mo.,
Tompkins, Orlando,	Boston, Mass.,
Toplis, Robt. J.,	Yonkers, N. Y.,
Trask, Chas. M.,	White River Junction,
Trimble, Henry,	Philadelphia, Pa.,
Troth, Sam'l F.,	Philadelphia, Pa.,
Tufts, Chas. A.,	Dover, N. H.,
Tulley, Andrew J.,	New York, N. Y.,
Tuma, Bruno O. C.,	New Orleans, La.,
Turner, George H.,	Albany, N. Y.,
Turner, T. Larkin,	North Weymouth, Mas
Turrell, Judson W.,	Longmont, Colo.,
Tyson, Sam'l E.,	Georgetown, D. C.,
Uhl, Chas.,	Memphis, Tenn.,
Underwood, Chas. G.,	Boston, Mass.,
Vandervoort, R. W.,	Newark, N. J.,
Vennard, Wm. L.,	New York, N. Y.,
Vincent, Lorren S.,	Dayton, O.,
Vogt, Diedrich,	Charleston, S. C.,
Vonachen, Frank H.,	Peoria, Ill.,
Vreeland, Frank L.,	San Francisco, Cal.,
Waite, Sam'l B.,	Washington, D. C.,
Waldheim, A. S. (Hon.),	Vienna, Austria,
Walling, Walter A.,	Providence, R. I.,
Walton, Joseph B.,	Washington, D. C.,
Ward, Benj.,	Mobile, Ala.,
Warner, Wm. R.,	Philadelphia, Pa.,
Warren, Chas. H.,	Brandon, Vt.,

		Elected.	Died.
Warren, Wm.,	Brighton, Mass.,	1867	1871
Watson, Wm. J.,	Brooklyn, N. Y.,	1853	1872
Wayne, Ed. S.,	Cincinnati, O.,	1854	1885
Weaver, Jas.,	New York, N. Y.,	1860	1883
Weaver, Joseph T.,	Philadelphia, Pa.,	1868	1882
Webber, Joseph T.,	Springfield, Mass.,	1873	1887
Webster, Stephen,	Boston, Mass.,	1875	1886
Wehrly, Thos. McA.,	Washington, D. C.,	1883	1897
Weichsel, Francis,	Dallas, Tex.,	1881	1891
Weisman, Aug. W.,	New York, N. Y.,	1869	1883
Wells, Jacob D.,	Cincinnati, O.,	1864	1893
Weusthoff, Otto S.,	Dayton, O.,	1879	1890
Weyman, Geo. W.,	Pittsburg, Pa.,	1858	1864
Wheeler, Lucien F.,	Walds, Fla.,	1858	1889
White, Aaron S.,	Mt. Holly, N. J.,	1860	1897
White, Dan'l F.,	Charlestown, Mass.,	1859	1864
White, Wm. H.,	Meridian, Miss.,	1891	1897
White, Wm. P.,	Chicago, Ill.,	1865	1866
Whitehead, Silas,	Lynchburg, Va.,	1856	1858
Whiting, Fred. T.,	Great Barrington, Mass.,	1863	1895
Wiggers, H. A. L. (Hon.),	Göttingen, Germany,	1877	1880
Wilcox, Fred.,	Waterbury, Conn.,	1878	1897
Wilder, Graham,	Louisville, Ky.,	1868	1885
Wilhite, Frank T.,	Anderson, S. C.,	1893	1900
Willard, Joseph,	Chicago, Ill.,	1865	1878
Wilkins, Dan'l G.,	Boston, Mass.,	1865	1880
Wilson, Adam H.,	Philadelphia, Pa.,	1859	1880
Wilson, Frank M.,	Willimantic, Conn.,	1883	1901
Wilson, Geo. C.,	Boston, Mass.,	1859	1861
Wilson, John E.,	Walnut Ridge, Ark.,	1896	1898
Wiseman, Chas.,	Baltimore, Md.,	1856	1862
Wittstein, Geo. C. (Hon.),	Munich, Germany,	1868	1887
Witzell, Louis,	Cincinnati, O.,	1864	1867
Wood, A. F.,	New Haven, Conn.,	1876	1885
Wood, Geo. B.,	Philadelphia, Pa.,	1857	1878
Wood, Gilbert D.,	Baltimore, Md.,	1856	1863
Woodbridge, Geo. W.,	Boston, Mass.,	1859	1890
Woods, Sam'l H.,	Boston, Mass.,	1850	1869
Woodward, B. W.,	Lawrence, Kan.,	1895	1900
Worthington, J. W.,	Moorestown, N. J.,	1873	1887
Wright, Archibald,	Philadelphia, Pa.,	1868	1891
Wright, Chas.,	New Orleans, La.,	1891	1891
Wright, Geo.,	New York, N. Y.,	1869	1873
Wright, Wm. A.,	Memphis, Tenn.,	1891	1891
Wright, Wm. R.,	Boston, Mass.,	1875	1883
Young, John E.,	Vergennes, Vt.,	1875	1882
Zeilen, J. Henry,	Philadelphia, Pa.,	1859	1896
Zwick, Geo. A.,	Covington, Ky.,	1874	1899

GENERAL INCORPORATION LAW FOR THE DISTRICT OF COLUMBIA.

SECTIONS APPLICABLE TO THE AMERICAN PHARMACEUTICAL ASSOCIATION.

CLASS 3, SOCIETIES, BENEVOLENT, EDUCATIONAL, ETC.

SEC. 545. Any three or more persons of full age, citizens of the United States, a majority of whom shall be citizens of the District, who desire to associate themselves for benevolent, charitable, educational, literary, musical, scientific, religious, or missionary purposes, including societies formed for mutual improvement, or for the promotion of the arts, may make, sign, and acknowledge before any officer authorized to take acknowledgment of deeds in the District, and file in the office of the Recorder of Deeds, to be recorded by him, a certificate in writing, in which shall be stated:

First. The name or title by which such society shall be known in law.

Second. The term for which it is organized, not exceeding twenty years.

Third. The particular business and object of the society.

Fourth. The number of its trustees, directors, or managers for the first year of its existence.

SEC. 546. Upon filing their certificate, the persons who shall have signed and acknowledged the same, and their associates and successors, shall be a body politic and corporate, by the name stated in such certificate; and by that name they and their successors may have and use a common seal, and may alter and change the same at pleasure, and may make by-laws and elect officers and agents; and may take, receive, hold and convey real and personal estate necessary for the purposes of the society as stated in their certificate.

SEC. 547. Such incorporated society may annually, or oftener, elect from its members its trustees, directors, or managers, at such time and place, and in such manner as may be specified in its by-laws, who shall have the control and management of the affairs and funds of the society, and a majority of whom shall be a quorum for the transaction of business; and whenever any vacancy shall happen among such trustees, directors, or managers, the vacancy shall be filled in such manner as shall be provided by the by-laws of the society.

SEC. 548. The trustees, directors, or stockholders of any existing benevolent, charitable, educational, musical, literary, scientific, religious, or missionary corporation, including societies formed for mutual improvement, may, by conforming to the requirements herein, re-incorporate themselves, or continue their existing corporate powers under this chapter, or may change their name, stating in their certificate the original name of such corporation as well as their new name assumed; and all the property and effects of such existing corporation shall vest in and belong to the corporation so re-incorporated or continued.

SEC. 549. Such corporations may sell and dispose of any real estate they may acquire by purchase, gift, or devise, as follows: whenever any lot purchased for the use of the corporation, or any building erected thereon, shall become ineligible for the uses for which the lot was purchased or the building erected, to be determined by a vote of two-thirds of the shares of the stock of the corporation or the members of the corporation, at a meeting of the stockholders, or corporators, or members specially called for that purpose, the proceedings of which meeting shall be duly entered in the records of the

corporation; said lot or building may be sold, and the proceeds thereof may be vested in another lot, or in the erection of another building, or both.

SEC. 550. When any real estate shall have been devised or given to any such corporation for any specified benevolent purpose, and where, by a vote of three-fourths of the stock held by the stockholders, or three-fourths of the corporators, if no shares of stock have been created, at a meeting called for the purpose, of which such stockholders or corporators or members shall have at least ten days' notice, the corporation shall determine to surrender their corporate powers and cease to act under the same, said real and personal estate so acquired shall be sold at public auction, proper notice of the time and place of sale having been given, and the proceeds of the sale equitably distributed among the stockholders or corporators, or disposed of for the promotion and advancement of the objects for which such corporation was originally organized.

SEC. 551. No corporation acting under the six preceding sections shall hold real estate more than five years, except so much as shall be necessary for the purposes named in its certificate.

SEC. 552. The provisions of this chapter shall not extend or apply to any association or individual who shall, in the certificate filed with the Recorder of Deeds, use or specify a name or style the same as that of any previously existing incorporated body in the District.

Approved 5 May, 1870, c. 80, v. 16, pp. 98-116—Revised Statutes of the United States, relating to the District of Columbia.

CERTIFICATE OF INCORPORATION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

Whereas, we, the undersigned, desire to form an association having for its object to unite the educated and reputable Pharmacists and Druggists of America, as will more fully hereinafter appear;

Now, therefore, we do hereby certify as follows:

First, The corporate name of the association is the American Pharmaceutical Association.

Second, This association shall continue until dissolved by the action of its members, or by the operation of law.

Third, The objects and business of said Association are as follows:

a. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulterations.

b. To encourage proper relations between Druggists, Pharmacists, Physicians, and the people at large, which shall promote the public welfare, and tend to mutual strength and advantage.

c. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and in encouraging home production and manufacture in the several departments of the drug business.

d. To regulate the system of apprenticeship and employment, so as to prevent, so far as possible, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

e. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

f. To uphold standards of authority in the education, theory and practice of Pharmacy.
g. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and the greatest protection to the public.

Fourth. The concerns and affairs of the Association shall be managed by a Council, which shall consist for the first year of John U. Lloyd, Maurice W. Alexander, Alexander K. Finlay, Karl Simmon, Samuel A. D. Sheppard, John M. Maisch, James Vernor, C. Lewis Diehl, William H. Rogers, William Saunders, Albert E. Ebert, Philip C. Candidus, George W. Kennedy, Albert H. Hollister, James M. Good, Lewis C. Hopp and William Dupont.

Given under our respective hands and seals this 12th day of December, A. D. 1887.

Signed :	JOHN U. LLOYD,	MAURICE W. ALEXANDER,
	ALEX. K. FINLAY,	KARL SIMMON,
	SAMUEL A. D. SHEPPARD,	JOHN M. MAISCH,
	JAMES VERNOR,	C. LEWIS DIEHL,
	WILLIAM H. ROGERS,	WM. SAUNDERS,
	ALBERT E. EBERT,	PHILIP C. CANDIDUS,
	GEORGE W. KENNEDY,	ALBERT H. HOLLISTER,
	JAMES M. GOOD,	LEWIS C. HOPP,
		WILLIAM DUPONT,

Members of the Council,
And

JOHN A. MILBURN,	G. G. C. SIMMS,
E. B. BURY,	Z. W. CROMWELL,
W. S. THOMPSON,	JOHN R. MAJOR,
CHARLES CHRISTIANI,	W. G. DUCKETT,
A. J. SCHAFHIRT,	GEO. W. BOYD,
O. H. COUMBE,	HENRY A. JOHNSTON,
GEO. B. LOCKHART,	W. C. MILBURN,
T. C. MURRAY,	ARTHUR NATTANS,
JOSEPH R. WALTON,	THOMAS M. WEHRLY,

of the District of Columbia.

(Notaries' certificates attached to the original document attest the genuineness of each and every signature.)

Received for Record February 21st, 1888, at 1:05 P. M., and recorded in Liber No. 4, fol. 302, Acts of Incorporation, District of Columbia, and examined.

Signed : JAMES M. TROTTER, *Recorder.*

SEAL :
Office of Recorder of Deeds,
District of Columbia,
Washington, D. C.

CONSTITUTION AND BY-LAWS

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION.

CONSTITUTION.

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market, by preventing the importation of inferior, adulterated, or deteriorated drugs, and by detecting and exposing home adulterations.
2. To encourage such proper relations among Druggists, Pharmacists, Physicians, and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.
3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.
4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.
5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.
6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.
7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge, with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the Council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be submitted in writing, and may be balloted for at the next Annual Meeting, when, upon receiving the votes of three-fourths of the members present, it shall become a part of this Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS.

CHAPTER I.

Of the President and Vice-Presidents.

ARTICLE I. The President shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all a President *pro tempore*, shall perform the duties of President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting, and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees, not provided for in the By-Laws or otherwise directed by the Association.

ARTICLE VIII. He shall sign the certificates of membership, and countersign all orders on the Treasury. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER II.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary of \$1000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general sessions, and carefully preserve, on file, all reports, essays, and papers of every description presented to the Association, and shall be charged with the necessary foreign and scientific correspondence, and with editing, publishing, and distributing the Report of the Proceedings of the Association, under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called; shall notify the chairman of every standing and special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act. He shall notify every member at least two weeks in advance of the time and place of each annual meeting.

CHAPTER III.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall reside at or near the place where the next annual meeting of the Association is to be held.

ARTICLE II. He shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairmen of the several committees, and with other members, in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers, and apparatus destined for use or exhibition at the meetings.

ARTICLE III. An exhibition of objects interesting to pharmacists, may be held each year, should the Council so determine, under the direction of the Local Secretary and the Committee on Commercial Interests.

CHAPTER IV.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, countersigned by the President, and accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary of \$750, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds to the amount of \$5,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by two sureties or a Trust Company acceptable to the Council.

CHAPTER V.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary of \$750.

ARTICLE II. All journals and volumes received in exchange for the Proceedings by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such statistical and biographical notices as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall commence with July 1st of the preceding year, and end with June 30th of the year in which it is submitted, shall be written in a form fitted for the printer, and shall be presented completed at the annual meeting, unless such meeting is held previous to August 1. An introduction or synopsis of the Report to be presented to the Section on Scientific Papers.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VI.

Of the Council.

ARTICLE I. The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association. Any member of the Association may attend the meetings of the Council, and may, by vote of the Council, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of twenty-two members, nine of whom, se

lected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the places of those whose terms will then expire, to serve for the term of three years. None but *ex-officio* members of the Council shall be eligible for re-election thereto until one year after the expiration of their term of office.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, the Chairmen of the Sections of the Association, and the Secretary of the Council, shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, three standing committees of the Council—a Committee on Membership, a Committee on Publication, and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

ARTICLE VIII. *Section 1.* The Council shall have charge of the revision of the roll and the publication of the Proceedings.

Section 2. The Secretary of the Council shall read at each of its sessions the names of those candidates for membership which have been proposed, when a vote of two-thirds shall be sufficient to recommend them to the Association.

Section 3. The Council shall decide upon any objections which may be presented to them (which must be in writing, with the member's name attached), referring to the fitness of the candidates for membership; and no name shall be voted on by the Association without first receiving the approval of the Council.

Section 4. The Committee on Membership shall report at each annual meeting of the Council a revised roll of members, with appropriate notices of deceased members.

ARTICLE IX. The Council shall furnish to each member of the Association not in arrears, one copy of the annual Report of the Proceedings, which publication shall contain the correct roll of members, full minutes of the several sessions of the Association and of the Sections, a complete synopsis of the minutes of the Council, the reports of the President and Committees, together with such addresses, scientific papers, discussions, notices of new processes and preparations, as it may deem worthy of insertion. It shall also fix the price at which the Proceedings may be sold.

CHAPTER VII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and whether in business on his own account, retired from business, or and those teachers of Pharmacy, Chemistry and Botany, who may in Pharmacy and Materia Medica, who, after duly considering the tion and the obligations of the Constitution and By-laws, subscribe to membership; provided that any person whose name has been of membership for non-payment of dues shall be re-admitted on made application in regular form—the application being accompanied and shall also have made an additional payment of five dollars, for entitled to any volume of the Proceedings.

ARTICLE II. Any two members of the Association may propose name of any person eligible to membership, and if approved, they mend the person named to the Association, and post the name in the meeting hall, near the beginning of a session: objection, if any, ing, to the Secretary of the Council, previous to the Association taking proposition. Near the close of the same, or at a subsequent session may, by vote, elect such person a member, after which his membership completed by his signing the Constitution and By-Laws, and paying the current year.

ARTICLE III. Every member shall pay in advance to the Treasurer *Dollars* as his yearly contribution, and by neglecting to pay said *successive years* he may be dropped from the Roll.

ARTICLE IV. Any member not in arrears to the Association, who Treasurer the sum of \$75 during the first year of his connection the years \$70, or after ten years \$60, or after fifteen years \$50, or after after twenty-five years \$30, or after thirty years \$20, or after thirty-five member who shall have paid to the Treasurer annual dues for this become a life member, and shall be exempt from all future annual dues.

ARTICLE V. All local organizations of Pharmacists shall be entitled as their representatives in the annual meetings, who, *if present*, become Association on signing the Constitution and paying the annual dues for the current year: Provided, that the provisions of this article shall not be reinstate any member whose name shall have been dropped from the ment of dues; nor shall any one who has been expelled from the Association as a delegate. All credentials shall be sent to the General Secretary in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of *Five* from the Treasurer a certificate of membership signed by the President, the General Secretary, and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing Secretary or Treasurer, but no resignation shall be accepted from arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings.

CHAPTER VIII.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided, that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, four Sections shall be formed, as follows: 1. Section on Scientific Papers; 2. Section on Commercial Interests; 3. Section on Practical Pharmacy and Dispensing; 4. Section on Pharmaceutical Legislation and Education.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of Council, act on the report of Council on membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. At the third session the business of the Section on Commercial Interests shall be considered.

ARTICLE VI. The fourth and fifth sessions shall be devoted to the subject of Practical Pharmacy and Dispensing.

ARTICLE VII. The sixth and seventh sessions shall be devoted to the reading of Scientific Papers and the discussions thereof.

ARTICLE VIII. At the eighth and ninth sessions the Section on Pharmaceutical Legislation and Education shall consider the business assigned to that Section.

ARTICLE IX. A Chairman and a Secretary shall be elected by ballot by each Section to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE X. The Chairman of each Section shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his Section, to be read before the Section at the annual meeting.

ARTICLE XI. There shall be elected by each Section a Committee, of which the Chairman of the Section shall be Chairman, to whom shall be delegated the duty of arranging

BY-LAWS OF THE AMERICAN PHARMACEUTICAL AS

in advance the business to come before the Section at the next committees in each case becoming Standing Committees of the A

ARTICLE XII. The order of business at the first session of each a as follows :

Section 1. Promptly at the time named in the notice issued for dent, or, in his absence, one of the Vice-Presidents, or, in their ab *tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the Preside cording Secretary *pro tempore*, who shall perform the duties of until his arrival.

Section 3. Nineteen members shall constitute a quorum for the t

Section 4. The President's address may then be read, after which port the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by tl in full, and laid on the table for future consideration.

Section 6. The President shall call the roll of States, the Territori bia and the Provinces of Canada, requesting the members preser Territory to appoint two members, the persons so selected to act as : nate officers for the Association and members of the Council for the in addition to which the President shall appoint five members fro large to act with the Committee. Delegates who are not members membership before they are eligible to serve on the Nominating Cor

Section 7. The minutes of the Council shall be read in full at th the Association, and its acts, if approved, shall be sustained by a vo the members present; or, if disapproved by a majority of the mem shall be revised, so as to be acceptable to the Association.

Section 8. A committee of five on time and place of meeting shall President at the first session, to report at the second session.

Section 9. Incidental business.

ARTICLE XIII. The order of business at the second general se meeting shall be as follows :

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding be amended, if necessary, and shall then be approved.

Section 3. The Report of the Committee on Nominations shall President shall appoint tellers, and the persons nominated shall be ba

Section 4. Reading of the Minutes of the Council.

Section 5. The Council shall present names of persons recommend

Section 6. Reading of the Reports of the Treasurer and General Se

Section 7. Reports of Standing Committees shall be read.

Section 8. Reports of Special Committees shall be read.

Section 9. Incidental business.

ARTICLE XIV. The order of business for the sessions of the Section mined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treas Sections.

ARTICLE XVI. At the last general session of the Association the new of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER IX.

Of Committees.

ARTICLE I. There shall be appointed or elected eight Standing Committees as follows: a Committee on Commercial Interests, a Committee on the Revision of the Pharmacopœia, a Committee on Practical Pharmacy and Dispensing, and a Committee on Pharmaceutical Legislation and Education, each to consist of five members; a Committee on Scientific Papers, a Committee on the Ebert Prize, a Committee on General Prizes, each to consist of three members; and a Committee on Transportation, to consist of ten members.

ARTICLE II. The Committee on Commercial Interests shall be elected by the Section on Commercial Interests. It shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting. It shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of this Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE III. The Committee on Scientific Papers shall be elected by the Section on Scientific Papers. It shall arrange the business of the Section, and shall report a number of questions of scientific and practical interest, the answers to which may advance the interests of Pharmacy, and shall procure the acceptance of as many such questions for investigation as may be practicable.

ARTICLE IV. Any person preparing a paper for the Association which will require more than ten minutes for its reading, must accompany the same with a synopsis which can be read within ten minutes' time. The paper and synopsis must both be furnished the Committee of the particular Section to which it refers, previous to the first session.

ARTICLE V. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Section on Scientific Papers, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE VI. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE VII. The Committee on Practical Pharmacy and Dispensing shall be elected by the Section on Practical Pharmacy and Dispensing. It shall arrange in advance the business to come before the Section at the next annual meeting. It shall propose a series of subjects for general discussion, and solicit papers on subjects pertaining to the actual practice of pharmacy in retail stores.

ARTICLE VIII. The Committee on Pharmaceutical Legislation and Education, which shall be elected by the Section on Pharmaceutical Legislation and Education, shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines. It shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year. It shall arrange the business of the Section in advance of its sessions, propose

the State Associations, and, at the following annual meeting of this Association, shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE IX. The Committee on Revision of the United States Pharmacopœia shall be appointed by the President of the Association. It shall collect and codify such facts as may serve as a basis of the report to be presented by this Association to the National Convention for revising the Pharmacopœia. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia, so as to facilitate and aid the work of the National Committee on Revision of the U. S. P.

ARTICLE X. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul or Minneapolis, Denver and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

CHAPTER X.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the yeas and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

CHAPTER XI.

Miscellaneous.

ARTICLE I. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

ARTICLE II. Every proposition to alter or amend these By-Laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the By-Laws.

ARTICLE III. No one or more of these By-Laws shall be suspended.

BY-LAWS OF THE COUNCIL.

CHAPTER I.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of the new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairmen of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary of \$150.

ARTICLE II. He shall post in a conspicuous place in the meeting-room the names of the applicants for membership.

ARTICLE III. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the yeas and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Membership.

ARTICLE I. The Committee on Membership shall consist of seven members of the Council, to be elected annually by ballot. The General Secretary and the Treasurer of the Association shall be *ex-officio* members of this committee. The committee shall elect its chairman immediately after the election of its members by the Council.

ARTICLE III. It shall furnish appropriate biographical sketches of deceased members for publication in the Report of the Proceedings.

ARTICLE IV. The Secretary of the Committee shall receive an annual salary of \$150.

CHAPTER V.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council. Immediately after its election by the Council, the Committee shall elect a Chairman.

ARTICLE II. The Committee on Publication shall have charge of the publication and distribution of the Report of the Proceedings.

CHAPTER VI.

Of Committee on Finance.

ARTICLE I. The Committee on Finance shall consist of three members, who shall audit all bills of the Association, and orders on the Treasurer for the payment of bills shall not be issued without the consent of the Finance Committee.

CHAPTER VII.

Of the Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and of the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VIII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Five members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows :

1. Organization by the election of the Chairman, Vice-Chairman, and the Secretary.
2. Election of the Standing Committees of Council, as follows :
 - a. Committee on Membership, consisting of seven members of the Council, the General Secretary and the Treasurer.
 - b. Committee on Finance, three members.
 - c. Committee on Publication, five members.
 - d. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. The reading of the names of new members as provided in the By-Laws.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER IX.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council, or the Chairman of the Committee, may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if the members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

SECTION ON COMMERCIAL INTERESTS.

ORDER OF BUSINESS.

1. Calling the Section to Order.
 2. Reading of the Chairman's Address.
 3. Reports of Committees.
 4. Reading of Papers.
 5. New Business and Discussion.
 6. Nomination and Election of Officers for the ensuing year.
 7. Installation of Officers.
 8. Reading of the Minutes.
 9. Adjournment.
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SECTION ON PRACTICAL PHARMACY AND DISPENSING.

ORDER OF BUSINESS.

FIRST SESSION OF THE SECTION.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Discussion of Topics presented in Chairman's Address.
4. Reports of Committees.
5. Reading of Papers.
6. Exhibition of rare prescriptions and difficulties in compounding.
7. Nominations of Officers.
8. Adjournment.

SECOND SESSION OF THE SECTION.

1. Reading of Minutes of previous Session.
2. Election of Officers for ensuing year.
3. Exhibition of new or interesting apparatus or inventions.
4. Exhibition of rare or new drugs and pharmaceutical preparations.
5. Reading of papers.
6. Installation of Officers.
7. New business.
8. Reading of Minutes.
9. Final Adjournment.

SECTION ON SCIENTIFIC PAPERS.

ORDER OF BUSINESS.

FIRST SESSION OF THE SECTION.

1. Calling the Section to Order.
2. Reading of the Chairman's Address.
3. Reports of Committees, if there be any to make, and appointment of such new Committees as may appear desirable.
4. Nominations (but not elections at this sitting) for the new officers of the Section.
5. Reading of Papers and discussions on the subjects brought up.
6. Adjournment.

SECOND SESSION OF THE SECTION.

1. Reading of Minutes of previous Session.
 2. Election of Officers for the ensuing year. Further nominations may be made at this time.
 3. Reports of Committees—Incidental Business.
 4. Reading of Papers and Discussion.
 5. Installation of Officers.
 6. New Business.
 7. Reading of Minutes.
 8. Final Adjournment.
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SECTION ON EDUCATION AND LEGISLATION.

ORDER OF BUSINESS.

FIRST SESSION OF THE SECTION.

1. Calling the Section to Order.
2. Reading of the Address of the Chairman.
3. Report of the Secretary.
4. Reports of Committees.
5. Nominations of Officers for the ensuing year. The election to take place at the opening of the second session.
6. Reading of Papers and Discussion.
7. Adjournment.

SECOND SESSION OF THE SECTION.

1. Reading of Minutes of the previous session.
2. Election of Officers for the ensuing year.
3. Reports of Committees.
4. Reading of Papers and Discussion.
5. New Business.
6. Installation of Officers.
7. Reading of Minutes.
8. Final Adjournment.

GENERAL RULES OF FINANCE.

ADOPTED 1883, AMENDED 1885, 1887, 1888, 1895, 1900, 1901.

First, The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee, and approved by the Council.

Second, Said money shall be deposited in the name of the American Pharmaceutical Association, and all checks shall be drawn by the Treasurer, and shall be countersigned by the Chairman of the Council.

Third, All bills due by the Association shall be paid by numbered checks on said banking company, the checks, when returned to the Treasurer, to be attached to the several vouchers.

Fourth, The Treasurer shall make a deposit in the bank whenever the money in his hands shall amount to fifty dollars.

Fifth, The Chairman of the Council shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him; duplicate accounts to be kept by the Chairman of the Council, who shall make an annual report of the same to the Association.

Sixth, There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town, the Chairman to be a member of the Finance Committee.

Seventh, The Treasurer shall balance his books July 1st of each year, and shall make out, previous to the fifteenth day of July following, his annual report for the financial year just closed.

Eighth, The Treasurer having thus balanced his books and made out his report, shall forward all his books, accounts, vouchers, etc., with the report, to the Chairman of the Auditing Committee, at such time and place in July of each year as said Chairman may direct.

The Chairman of the Council, in the presence of another member of the Association, shall make a list of the numbers and amounts of the bonds belonging to the Association, and both shall make affidavit to such list, which shall then be forwarded to the Auditing Committee for their use in auditing the books of the officers of the Association.

Ninth, Said books, accounts, vouchers, etc., shall be returned to the Treasurer, and said bonds, saving-bank books and accounts of the same to the Chairman of the Council, all within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Tenth, There shall be a meeting of the Auditing Committee in July of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., etc., received by them; and previous to the 1st day of August following, to make a report thereon, in writing, to the Chairman of the Council.

Eleventh, The expense of the bond of the Treasurer, given by a Trust Company, shall be paid for from the Treasury.

Twelfth, The Treasurer shall furnish with his annual report an alphabetical list of the names of the members from whom he has received money for dues and certificates during the financial year, for publication in the Proceedings.

Thirteenth, The Finance Committee shall each year, previous to June 1st, present to the Council for its consideration a list of appropriations to cover the various expenditures of the coming fiscal year, the total of such appropriations to be based on the probable amount to be received from the annual dues for the coming year. No payment shall be made in excess of said appropriation except by special vote of the Council. *Provided*, however, that the Treasurer shall be authorized to transfer from one account to another, such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (50) dollars.

Fourteenth, Whenever in the judgment of the Finance Committee it shall be necessary, they shall send a written order to the Treasurer, signed by at least two members of said Committee, directing him to use the whole or a portion of the interest of the Life Membership Fund for the current year to defray the expenses of the Association.

Fifteenth, All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

FORM OF APPLICATION FOR MEMBERSHIP.

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-laws, I hereby signify my approval of the same, and subscribe to them. I also enclose the annual contribution, five dollars, for the first year of my membership.

Name in full

Number and Street

Town and State

Recommended by the undersigned two members in good standing:

.....

FORMS OF PROPOSITIONS AND OF COMPLETING MEMBERSHIP IN ACCORDANCE WITH CHAPTER VII., ARTICLE II., OF THE BY-LAWS.

THE undersigned members in good standing, being personally acquainted with the following persons eligible to membership in accordance with Chapter VII., Article II. of the By-Laws, testify to their moral character, their skill as practical druggists and pharmacists, and their professional probity and good standing, and they recommend them for membership in the American Pharmaceutical Association.

NAMES OF CANDIDATES.

ADDRESS.

Proposed by

.....

APPROVING of the objects of the American Pharmaceutical Association, and having read its Constitution and By-Laws, I hereby signify my approval of the same, and subscribe to them, and enclose the annual contribution, five dollars, for the current year.

Name in full

Date

Address

.....

To be sent to H. M. Whelpley, Secretary of the Committee on Membership Am. Ph.
Assoc. Pottsville, Penn.

ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

Dr. John Attfield, F. R. S., *Watford*, 1871. Joseph Ince, F. L. S., *London*, 1882.
Michael Carteighe, F. I. C., *London*, 1882. E. M. Holmes, F. L. S., *London*, 1899.

GERMANY.

Dr. Edward Schaer, *Strassburg*, 1877. Dr. Carl Schacht, *Berlin*, 1882.
Dr. Frederick Hoffmann, *Berlin*, 1898. Dr. Ernst Schmidt, Geh. Reg. Rath,
Marburg, 1899.

INDIA.

David Hooper, F. I. C., F. C. S., *Calcutta*, 1899.

RUSSIA.

Johannes von Martenson, Staatsrath, *St. Petersburg*, 1882.

ACTIVE MEMBE

Members are requested to report any inaccuracies in the
Secretary and Treasurer of all chapters.

(The names of Life Members in SMALL CAPITALS
under the old Constitution in

UNITED STATES OF A

ALABAMA.

Anniston.

Wikle, Jesse Lane 1898

Auburn.

Miller, Emerson Romeo 1895

Mobile.

Brown, Albert Edward 1887

CANDIDUS, PHILIP CHARLES 1857

Punch, William Francis 1874

Montgomery.

Brigham, Laurence Stanton 1898

Knabe, Gustavus Alexander 1876

ARIZONA.

Prescott.

Brisley, Harry 1894

ARKANSAS.

Batesville.

Fletcher, John Wade 1894

Camden.

Green, Samuel Leonard 1901

Morgan, Aylmer Lee 1890

El Dorado.

Appleton, William Riley 1901

Fort Smith.

Sparks, James Mitchell 1894

Fulton.

Battle, Orrin McRee 1902

Helena.

King, Robert Bruce 1901

Chesnutt,

Klein, Err

Bond, John

Bond, John

Dowdy, Jo

Snodgrass,

Dewoody,

Skinner, W

Laird, John

Bohmansson

Fi

Kerr, William

Kirkland, D

Hammer, Al

Levinson, Jos

Jesson, Jacob

Lichthardt, G

San Francisco.

Barbat, Josephine Eugenia.....	1900
Bayly, Charles Alfred	1889
Beck, Henry Martin	1902
Bernheim, Moses Ralph.....	1902
Bowerman, Kenneth Burton	1902
Boyken, John William.....	1902
Burnett, George Glasgow	1902
<i>Calvert, John</i>	1870
Colegaris, Joseph.....	1902
Dahlbender, George.....	1902
Dawson, John Henry.....	1882
Drossel, August Adolph	1902
Esters von Krakau, James Henry Wil-	
liam	1897
Gove, David Merritt	1902
Grant, Isaac	1902
Irvine, Darwin William	1902
Jackson, William John	1900
Jorgenson, Edward B.....	1902
Pearman, William Edgar.....	1898
Schmidt, Valentine	1887
Scarby, William Martin.....	1882
Sharp, Sol. Albert	1902
Stange, Carl Frederick.....	1897
STEELE, JAMES GURDEN	1859
Stewart, Francis Edward.....	1884
Wenzell, William Theodore	1870
Zabaldano, Alexander	1902

Santa Monica.

Devine, John	1887
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Sonoma, Sonoma Co.

Shoults, Robert Grafton	1901
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Vallejo, Solano Co.

Topley, James.....	1869
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COLORADO.

Boulder.

Ramaley, Francis.....	1897
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Central City.

<i>Best, John</i>	1886
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Davies, Llewellyn Powell	1891
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Colorado Springs.

Ward, Augustus Jae.....	1893
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Cripple Creek.

Beitenman, William Wallace	1888
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Denver.

Anglum, John.....	1902
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Clark, Alfred William	1902
Depeyre, Louis Noël	1894
Ford, Charles Mangan	1887
Hall, Frank Morgan	1902
Hover, William Adgate.....	1895
Walbrach, Arthur.....	1881
Witting, Frederick Frank.....	1902

Leadville.

Kolsch, Julius.....	1902
Taylor, George Edward	1895

Pueblo.

Appelbaum, Jerome.....	1902
Ford, Edgar Frank	1902

COLUMBIA, DISTRICT OF.

Anacostia.

Weiss, Conrad Henry	1900
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Washington.

Boyd, George Washington	1883
Bradbury, Wymond Henry.....	1895
Campbell, Charles Berger	1902
Criswell, Francis McClure.....	1892
Duckett, Walter G.	1876
Easterday, Herbert Clifton.....	1893
Elliott, Charles Houston	1899
Ewell, Ervin Edgar	1898
Field, William Carlin.....	1898
Flemer, Lewis.....	1895
Franzoni, Joseph Dunbar	1900
Geddis, Frank.....	1902
Gordon, Frederick Troup	1900
Gross, Charles Ernest	1900
Harper, Robert Newton	1900
Henkel, Alice.....	1902
Henry, Frank Clinton.....	1894
Herbst, William Parker	1895
Hilton, Samuel Louis	1890
Hurlebaus, George William.....	1895
Jorgenson, Hans Christian.....	1899
Kebler, Lyman Frederic	1894
Luve, Frank A. A.....	1902
Major, John Richards	1873
Martin, John Charles	1883
Milligan, John Dean	1900
Neeley, Guy Minick.....	1900
Quigley, Richard Lucien.....	1902
Richardson, Willard Stowell	1900
Schafhirt, Adolph Julian.....	1876
SIMMS, GILES GREEN CRAYCROFT	1860

Stott, Samuel Thompson..... 1900
 Taylor, Augustus Carrier 1900
 Weller, Franklin Pierce 1900
 Wiley, Harvey Washington 1902

CONNECTICUT.

Bridgeport.

Fisher, Elbert Ellsworth 1892
 Hamilton, William Clinton..... 1902
 Hartigan, Joseph Dennis 1902
 Levery, John Augustine..... 1900

Danbury.

Dickinson, Arthur Lyman 1900

Hartford.

Bennett, James Nixon..... 1900
 Duggan, James..... 1894
 Edwards, Frederick Bulkeley..... 1894
 Ives, Orvin Francis..... 1900
 Rapelye, Charles Andrew 1876
 Seinsoth, John Jacob..... 1900
 Stoughton, Dwight George..... 1890
 Williams, John Kirby 1875

Meriden.

Mosher, William Wooster..... 1894

Middletown.

Pitt, John Richard..... 1872

Naugatuck.

Thompsonville, Hartford Co.

Smith, Edward Newton..... 1885

Waterbury.

Perkins, Charles William..... 1892
 Woodruff, Roderick Samuel..... 1876

DELAWARE.

Lewes.

Spangler, Lewis Clayton..... 1902

Wilmington.

Watson, Herbert Kennedy..... 1888

FLORIDA.

De Land.

Fisher, George Washington..... 1893

Jacksonville.

Crum, John Darius..... 1892

Monticello.

Palmer, John Dabney 1902

Mullet Key.

Stier, Carl 1902

Palatka.

Ramsaur, David Wilfong..... 1902

St. Augustine.

Smith, Lauriston Stephen 1802

<i>Augusta.</i>		<i>Cairo.</i>	
Durban, Sebastian Charles	1883	Metzger, Matthias Clyde	1902
Haines, Walter Scott	1902	Schub, Paul Gustav	1894
LAND, ROBERT HENRY	1859	<i>Camp Point, Adams Co.</i>	
Land, Robert Henry, Jr.	1902	Bartells, George Case	1881
<i>Bowdon.</i>		<i>Carbondale.</i>	
Lovvorn, James Lewis	1897	Patten, Eustis	1900
<i>Dawson, Terrill Co.</i>		<i>Carlinville, Maconpin Co.</i>	
Davidson, Edgar Cyrus	1902	Loehr, Theodore Christian	1888
<i>Elberton.</i>		Steinmeyer, William Otto	1901
Cleveland, Jule Mattox	1902	<i>Champaign.</i>	
<i>Greenville.</i>		Swannell, Henry	1902
Gilbert, Robert Bacon	1902	<i>Chicago.</i>	
Tigner, James Ogletree	1890	Adamick, Gnstave Hattenhauer	1891
<i>Macon.</i>		Bartlett, Nicholas Gray	1864
Brunner, Norman Isaac	1878	Batt, Herman	1902
Cheatbam, Thomas Alexander	1890	Baur, Jacob	1879
King, Campbell Thomas	1897	Behrens, Emil Christian Louis	1893
Lamar, Henry James	1897	BROTH, HENRY	1865
Morris, Max	1898	Conrad, John	1887
<i>Rome.</i>		Cooban, Benjamin Slater	1902
Curry, David W.	1894	Day, William Baker	1895
<i>Savannah.</i>		EBERT, ALBERT ETHELBERT	1864
Kolb, William Walter	1897	Fisk, Frank Elmer	1902
Rowlinski, Robert Antone	1892	Forsyth, William Kitchin	1902
Solomons, Isaiah Abram	1894	Fry, Herman	1902
<i>Thomasville.</i>		FULLER, OLIVER FRANKLIN	1869
Thomas, Robert, Jr.	1888	Gale, Edwin Oscar	1857
<i>IDAHO.</i>		Gale, Walter Henry	1901
<i>Emmett.</i>		Gale, William Henry	1857
Smithson, David Elmer	1890	Gordin, Harry Mann	1899
<i>ILLINOIS.</i>		Gordon, Jean	1902
<i>Albion.</i>		Grassly, Charles William	1884
Michels, Victor Clyde	1902	Gray, Margaret McClintock (Mrs.) ..	1901
<i>Allon.</i>		Gray, William	1892
Riley, Cassius Marcellus	1901	Hall, Mary Stillwell (Mrs.)	1901
<i>Aurora.</i>		Hallberg, Carl Swante Nicanor	1879
Staudt, Louis Carl	1890	Hereth, Franklin Samuel	1803
<i>Barry, Pike Co.</i>		Lord, Thomas	1882
Mercer, William Elmer	1902	Mares, Frank Martin	1902
<i>Blue Island.</i>		Matthews, Charles Edwards	1893
McPherson, George	1865	McConnell, Charles Henry	1899
		Miner, Maurice Ashbel	1880
		Oldberg, Oscar	1873
		Parsons, John	1865
		Patterson, Theodore Henry	1869
		Pattison, George Henry	1893

ROLL OF MEMBERS.

Puckner, William August	1888	
Rhode, Rudolph Ernst	1887	Ehrlicher,
Roesch, Anton	1901	
SARGENT, EZEKIEL HERBERT.....	1864	
Scherer, Andrew	1884	Benton, W.
Schmidt, Florian Charles.....	1882	Lueder, Fri
Schmidt, Frederick Michael	1887	Zimmerma
Schmidt, Oscar Weber	1889	
Schneider, Albert.....	1899	
Sempill, Walter Morrison	1892	Hoffmann,
Smallwood, William Thornton.....	1901	
Stephenson, Charles William	1902	Murphy, Jol
Thorburn, Albert David	1902	
Truax, Charles	1882	
Turnquist, Carl Martin.....	1901	Dodds, Rich
VOISS, ARCADIOUS	1901	Stro
WHITFIELD, THOMAS	1865	Harter, Isaa
Wisdom, Hugh.....	1901	H
WOLTERS DORF, LOUIS.....	1865	
Woods, Charles Henry Albert	1897	Eilbracht, W
Wooten, Thomas Victor	1893	
<i>Chicago Heights.</i>		
Michalek, John.....	1900	Miller, Chas.
<i>Columbia.</i>		
Rose, Herman Louis	1901	
<i>East St. Louis.</i>		
Knoebel, Thomas	1892	Otto, Theodo
<i>Geneseo.</i>		
Stamm, Dante Milton	1896	Stahlhuth, Er
<i>Girard, Macoupin Co.</i>		
Deck, Lewis Cass.....	1901	Schlaepfer, H
<i>Highland.</i>		
Mueller, Adolphus	1871	Gross, Williar
<i>Kankakee.</i>		
Rogers, Henry Horace	1895	Woodworth, C
<i>Moline.</i>		
Lindvall, Charles Gustaf.....	1897	Arnett, Willia
Sohrbeck, George Henry.....	1888	Carter, Frank
Sohrbeck, George William.....	1897	Eads, Robert
<i>Mount Vernon.</i>		
Bond, Jackson Newlon	1902	Eichrodt, Char
Morse, Edward Worth	1896	Field, Claud
<i>North Alton.</i>		
Barth, George Fred	1896	Frauer, Herma
		Huder, Henry
		Hurty, John N
		Lilly, Josiah K
		Timberlake, Al
		Waddell, Mino
		Walter, Charle
		Wolcott, Frank

<i>Lafayette.</i>		<i>Fort Dodge.</i>	
Glick, Harry Edwin.....	1900	Oleson, Olaf Martin.....	1877
Sturmer, Julius William	1901	<i>Fort Madison.</i>	
<i>La Porte.</i>		Schafer, George Henry	1871
Meissner, Frederick William, Jr.....	1890	<i>Homestead.</i>	
<i>Muncie.</i>		Miller, Frederick William	1902
Prutzman, Charles Oscar.....	1901	<i>Iowa City.</i>	
<i>New Albany.</i>		Boerner, Emil Louis	1877
Crecelius, Charles Edgar	1900	Louis, Henry.....	1902
Knoefel, Bruno.....	1896	Morrison, William Wilson	1902
Knoefel, Charles Deitrick	1894	Shrader, William Edwin.....	1902
<i>South Bend.</i>		Teeters, Wilber John.....	1902
Eliel, Leo	1882	<i>Logan, Harrison Co.</i>	
Meyer, Martin Monroe	1837	Hansen, Hans	1901
<i>Tell City.</i>		<i>Mason City.</i>	
Schreiber, Charles Christian Frederic August	1901	Burns, Edwin Miller	1897
<i>Troy.</i>		<i>Muscatine.</i>	
Gaesser, Theobald Theodore	1901	Halstead, Alice Louisa (Mrs.)....	1892
<i>Valparaiso.</i>		<i>Reinbeck.</i>	
Roe, Joseph Newton	1902	Junger, William Frederick Franklin ..	1902
<i>Warren.</i>		<i>Sioux City.</i>	
Hickerson, William Henry.....	1894	Andreen, Carl.	1902
IOWA.		Baker, Howard Spencer	1902
<i>Charles City.</i>		Kloster, Benjamin J.....	1902
Legel, John Gotthelf	1897	Koelle, Otto Charles.....	1902
<i>Clear Lake.</i>		Moore, Silas Harwood.....	1881
Etzel, John Leonhardt.....	1897	Scherling, Gustav.....	1884
<i>Coggon.</i>		Thelander, Chreston Carlos.....	1902
Hall, Lincoln Grant.....	1902	Thompson, Edwin Thomas	1902
<i>Davenport.</i>		Thompson, Joseph.....	1902
BALLARD, JOHN WINTHROP	1871	<i>Stuart.</i>	
<i>Des Moines.</i>		Treat, Joseph Augustus.....	1885
Howard, Fletcher	1895	<i>Waterloo.</i>	
Kinney, Charles Noyes	1901	Wangler, Conrad David ...	1876
Macy, Sherman Riley	1891	<i>Winfield, Henry Co.</i>	
<i>Dubuque.</i>		Lindly, John Milton	1901
Nachtwey, Frank Joseph.....	1901	KANSAS.	
Torbert, Willard Horatio	1887	<i>Atchison.</i>	
Wittmer, Joseph Washington, Jr.	1896	Noll, Mathias....	1901
<i>Essex, Page Co.</i>		<i>Gypsum City, Saline Co.</i>	
Eaton, Harry Ellsworth	1902	Schmitter, Jonathan	1892
		<i>Holton, Jackson Co.</i>	
		Naylor, William W.....	1901

Hutchinson.

Ardery, Lorimer.....1895

Kingman.

Cookson, Joseph Wesley.....1902

Lawrence.

Havenhill, L. D.1900

LEIS, GEORGE.....1869

Moore, John Thomas.....1888

Sayre, Lucius Elmer.....1883

Leavenworth.

Fisher, Dora Catherine1902

Ottawa.

Becker, Charles Lewis.....1892

Salina.

Graf, Carl Adolf.....1901

Topeka.

Holliday, Francis Emlen.....1900

Wilmore.

Sombart, John Edward.....1881

KENTUCKY.

Covington.

Pieck, Edward Ludwig.....1887

Zwick, Karl George.....1899

Flemingsburg.

Reynolds, John Jefferson.....1876

Frankfort.

Averill, William Henry.....1874

Gayle, John William1891

Lancaster, Garrard Co.

Stormes, John Evans.1902

Lexington.

Harting, Rudolph R.....1902

McAdams, Harry Kennett1902

Louisville.

Bell, Enil Remigius1899

Curry, Gordon Laten1900

DIEHL, CONRAD LEWIS.....1863

Dilly, Oscar Charles.....1888

Dimmitt, Addison1895

Edelen, Charles Augustin1901

Jones, Simon Newton1870

NEWMAN, GEORGE ABNER1866

Peter, Minor Cary1894

Rosenham, Charles Julius.....1902

Schiemann, Edward Bernard.....1880

Schlosser, Peter.....1902

Schoettlin, Albert John.....1882

Troxler, Constantine, Jr.1896

Votteler, William.....1895

Shelbyville.

Preissler, Henry Webber.....1893

Somerset.

Porter, Chilton Scott.....1882

LOUISIANA.

Bayou Goula.

Viallon, Paul Louis.....1870

New Iberia.

LEE, JAMES AUGUSTIN1856

New Orleans.

Brown, George Stewart.....1900

Capdau, Pierre August1902

Finlay, Alexander Kirkwood.....1883

Godbold, Fabius Chapman.....1887

Grambois, Augustin.....1891

Keppler, Christian Lewis1882

Legendre, Joseph Amilcar1891

Levy, William Michael1894

Lyons, Isaac Luria.....1875

Metz, Abraham Lewis.....1887

O'Gorman, Theophilus Vincent1897

Otto, John Nicholas Washington.....1891

Quin, Frank Woodard.....1902

Samson, Max1900

Sauvinet, Charles Daniel.....1902

Wunderlich, Edward....1891

Plaquemine.

Hiriart, Sebastian.....1891

Pollock.

Bonnette, James Valarus.....1902

Shreveport.

Bernstein, Michel.....1902

White Castle.

Viallon, Paul Louis, Jr.....1902

MAINE.

Auburn.

Jones, Oscar Winthrop1902

<i>Augusta.</i>		Base Daniel	1898
Partridge, Frank Reuben.....	1895	Beck, John Godlove.....	1899
<i>Bangor.</i>		Bobbitt, James Henry	1894
HARLOW, NOAH SPARHAWK.....	1859	Brack, Charles Emil.....	1876
Sweet, Caldwell	1881	Brickman, Arthur Otto	1898
<i>Bath.</i>		Burrough, Horace	1883
Anderson, Samuel	1876	Burrough, Horace, Jr	1901
<i>Biddeford.</i>		Caspari, Chas., Jr.....	1883
Boynton, Herschel.....	1875	Caspari, William, Jr.....	1898
Seidel, John Henry	1902	Corning, Albion James	1898
Traynor, Charles Francis.....	1902	Culbreth, David Marvel Reynolds....	1883
<i>Boothbay Harbor.</i>		Davis, John Alexander.....	1894
McClearn, Henry Trefethen	1896	Dohme, Alfred Robert Louis.....	1891
<i>Lewiston.</i>		DOHME, CHARLES EMILE	1863
Lowell, Edward Mark.....	1896	Dohme, Charles Louis.....	1899
Parmalee, Walter Woodruff	1901	DOHME, LOUIS	1859
Sanford, John Foy.....	1902	Dunning, Henry Armitt Brown	1902
<i>Machias.</i>		ELLIOTT, HENRY ALEXANDER.....	1859
Crane, Frank Trusseil	1894	EMICH, COLUMBUS VALENTINE	1863
<i>Oldtown.</i>		Feick, Charles.....	1901
Mutty, Walter Clement.....	1902	Foster, James Webb	1902
<i>Orono.</i>		Fouch, William M.....	1898
Jackman, Wilbur Fisk.....	1899	Frames, John Fuller.....	1890
<i>Portland.</i>		Gilpin, Henry Brooke.....	1889
Cook, Alfred Page	1902	HANCOCK, JOHN FRANCIS.....	1863
Drew, Walter Israel.....	1896	Hengst, John Edwin... ..	1900
Frye, George Carlton.....	1879	Hynson, Henry Parr.....	1890
Hay, Edward Allston	1889	Kornmann, Henry	1899
Morse, Frank Dana.....	1902	Kosminsky, Leonce Joe	1902
Perkins, Benjamin Abbott.....	1878	Maisch, Henry.....	1898
Schlotterbeck, Augustus George.....	1896	Mansfield, Samuel	1898
<i>Saco.</i>		Meyer, Charles Louis.....	1901
Sawyer, Charles Henry	1896	Millard, David Rockwell.....	1899
<i>South Windham.</i>		Morgan, Charles	1899
Rand, Daniel Moulton	1892	Muth, George Louis	1894
<i>Waterville.</i>		Muth, John Clement	1898
Dorr, George Watson	1896	Muth, John Sebastian	1898
MARYLAND.		Nattana, Arthur	1883
<i>Annapolis.</i>		Nordmann, Herman	1895
Henkel, Charles Bernard	1902	Pilson, Abram Owen.....	1898
Pearson, Joseph Frederick	1897	Quandt, Arthur Albert.....	1894
<i>Baltimore.</i>		Quandt, Ernest Edmund.....	1894
Barnett, Joel Jones	1899	Richardson, Thomas Leonard	1895
		Schmidt, Charles	1902
		Schrader, August Christian.....	1898
		Schulze, Louis	1892
		Schumann, Otto George	1902
		Sharp, Alpheus Phineas	1855
		Simon, William	1885
		Smith, Theodric.....	1890
		Streett, Edmund Oldfield.....	1898
		Stuart, William Alexander	1898

Troxel, Henry Louis.....1902
Ware, Charles Howard1898
Westcott, James Walling1890
Wiesel, John Martin.....1898
Williamson, Robert Edward Lee1898
WINKELMANN, JOHN HENRY.....1864

Cumberland.

Elderdice, William James.....1902

Hagerstown.

Aughinbaugh, David Culbertson1898
Meredith, Harry Lionel1900
Waltz, Charles Conley.....1898
WINTER, JONAS1863

Lonaconing.

Campbell, George Dowery1900

Snow Hill.

Powell, William Cottingham1895

Taneytown.

McKinney, Robert Sentman.....1898

MASSACHUSETTS.

Boston.

Baird, Julian William1894
Bassett, Charles Harrison.....1867
Boyden, Edward Cleveland1874
Burnham, Alfred Augustus, Jr.....1891
CANNING, HENRY.....1865
Capper, William Ernest1892
Colton, James Byers...1865
Cramer, Max.....1881
Day, Edward John.....1901
Doliber, Thomas1859
DRURY, LINUS DANA.....1871
Durkee, William Carley1885
French, John Innes.....1894
Gammon, Irving Parker1891
Godding, John Granville.....1875
Hayes, James Henry.....1892
Jones, James Taber1875
Lauricella, Felice.....1896
Lewis, Ernest Grant.....1892
Lowd, John Colby.....1871
Patton, Ichabod Bartlett.....1858
Pfaff, Franz.....1899
Pierce, William Herbert1879
Sawyer, William Frederick.....1885
Scoville, Wilbur Lincoln.....1891
Sharpless, Stephen Paschell.....1875

SHEPPARD, SAMUEL AIRUS DARLINGTON.1865
Small, Herbert Elwyn.....1901
Smith, Linville Holton1892
Stowell, Daniel.....1875
Tilden, Amos Kendall.....1892
Tucker, Greenleaf Robinson1890
Vargas-Heredia, Jorge1891
Varney, Edward Francis.....1892
Wells, Edwin Herbert.....1893
West, Charles Alfred1892
Wheeler, William Dexter1892
Williams, George Gorham1888
WILSON, BENJAMIN OSGOOD1859
Wood, Edward Stickney.....1879

Brockton.

Markoe, George Burger1897
Randall, Frank Otis.....1893

Cambridge.

Clafin, Walter Addison1896
Lynch, Frank Kernan.....1897
Phillips, Carrie Elizabeth1894
Seaverns, Martha Gilbert1902

Cambridgeport.

La Pierre, Elie Henry.....1892
Norton, George Edward.....1895
ORNE, JOEL STONE.....1859

Charlestown.

Cowan, John.....1897
STACEY, BENJAMIN FRANKLIN.....1860

Chelsea.

Buck, John Lynian1883

Concord.

Richardson, Horatio Stillman.....1892

Fall River.

Riddell, Benjamin Franklin1892

Fitchburg.

Estabrook, Henry Arthur.....1886

Gloucester.

Rogers, Anthony Charles1902

Holyoke.

Ball, Charles Ely1885
Heinritz, Lebrecht Gustav1902

Jamaica Plain.

Ernst, Frank Frederick.....1891

<i>Lawrence.</i>		Guerin, James Francis.....1898	
Glover, William Henry.....1891		Harris, Francis Mason .....1894	
<i>Leominster.</i>		Scott, George Theodore .....1883	
Nixon, Charles Frederic .....1900		MICHIGAN.	
<i>Lowell.</i>		<i>Ann Arbor.</i>	
Bailey, Frederick .....1869		Eberbach, Ottmar .....1869	
Butler, Freeman Hall .....1874		PRESCOTT, ALBERT BENJAMIN .....1871	
Hood, Charles Ira. ....1871		Schlotterbeck, Julius Otto.....1888	
Thomasson, Anders.....1892		Stevens, Alviso Burdette.....1885	
<i>Malden.</i>		<i>Berrien Springs.</i>	
Keaney, James John .....1899		Kephart, Philip. ....1902	
<i>Melrose.</i>		<i>Cass City, Tuscola Co.</i>	
Larrabee, John .....1897		Topping, Charles Orlando .....1889	
<i>New Bedford.</i>		<i>Corunna.</i>	
BLAKE, JAMES EDWIN.....1866		Reidy, Michael .....1894	
SHURTLEFF, ISRAEL HAMMOND.....1875		<i>Detroit.</i>	
<i>Newburyport.</i>		Allen, William Humphries.....1902	
Castlehun, Karl.....1902		Burke, William Henry.....1902	
Davis, Charles Leland.....1897		Doty, Wirt Payson.....1900	
Goodwin, William Wells .....1853		Famulener, Lemuel William .....1902	
<i>Newton.</i>		Hall, William Alanson.....1888	
Crowdle, John Edward .....1894		Helfman, Joseph.....1894	
Hudson, Arthur.....1882		Houghton, Elijah Mark .....1899	
<i>North Andover.</i>		Knox, James Wesley Thompson .....1898	
Murphy, John Philip.....1900		Lyons, Albert Byron .....1885	
<i>North Andover Depot.</i>		MacFadden, Warren Lester.....1902	
Perkins, George Henry .....1901		Mason, Harry Beckwith.....1896	
WHITNEY, HENRY MARTIN .....1859		Morris, Henry Michael. ....1902	
<i>Raynham.</i>		Perry, Frederick William Riley.....1885	
Crossman, George Alvin.....1872		Ryan, Frank Gibbs .....1892	
<i>Salem.</i>		Seltzer, Leonard Adams .....1899	
Nichols, Thomas Boyden.....1876		Sherrard, Charles Cornell.....1893	
Price, Charles Henry.....1882		Stearns, Frederick. ....1897	
Price, Joseph.....1888		Vernor, James.....1866	
<i>Shelburne Falls.</i>		Warren, William Matthew ..1889	
Baker, Edwin.....1875		<i>Flushing.</i>	
<i>Stoneham.</i>		Sprague, Wesson Gage.....1895	
Drake, Frederick Townsley.....1894		<i>Ionia.</i>	
Patch, Edgar Leonard.....1872		Gundrum, George .....1882	
Ward, Charles Abraham.....1891		<i>Kalamazoo.</i>	
<i>Worcester.</i>		McDonald, George .....1871	
Brewer, Howard Dickinson .....1902		Todd, Albert May. ....1885	
		<i>Saginaw.</i>	
		Heim, Henry . ....1900	
		Prall, Delbert Elwyn .....1902	

ROLL OF MEMBERS

MINNESOTA.

Duluth.

Abbett, William Allen.....	1901	Craig, V
LeRicheux, Alfred Charles.....	1901	Hart, Jc
Sweeney, Robert Ormsby.....	1866	

Minneapolis.

Allen, E. Floyd.....	1885	Bethea,
Danek, John Francis.	1895	Moore, J
Gamble, Stewart	1897	
Huhn, George	1884	Shreve, J
King, George Alexander Newton	1892	
Rauch, Henry	1897	
Thompson, Albert Delano	1895	
Wanous, Josephine Anna.....	1897	Mittelbac
Wittich, Matthew Henry.....	1897	
Wulling, Frederick John.....	1893	Kerns, W

New Ulm.

Eckstein, Andrew Joseph	1895	Knight, V
		PETTIT, F

Ortonville.

Nielson, John	1897	Hope, Ro
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Pelican Rapids, Otter Tail Co.

Axness, Ole Mikkelson	1895	Powell, W
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St. Paul.

Campbell, Albert Alexander.....	1902	Brandenbe
Collier, William Kelly.....	1897	
Conger, Frederic Albert	1902	Breunert, A
Dickman, Gustave Adolph.....	1902	Crampton,
Drechsler, Frank Xavier.....	1902	Eyssell, Ge
Frost, William Arthur.....	1892	Federmann
Hall, Alden Taylor	1902	Griffiths, Jc
Heller, Charles Tompkins.....	1895	Hess, Paul
Parker, Frederick M.	1902	Krueger, O
Reeves, Sidney Herbert	1902	Mente, Alv
Zimmermann, Bernard	1895	

Warren.

Whitney, Edgar Francis	1897	Ewing, Mar
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Wilmar.

Carlson, Swan B	1897	Hemm, Lou
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MISSISSIPPI.

Aberdeen, Monroe Co.

Eckford, Joseph William.....	1883	Farrar, Sam
		LLEWELLYN

Ellisville.

Ward, Homer Benjamin.....	1901	Ballagh, Wil
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New Madrid.

Hummel, John Andrew.....1901

Plattsburg.

Bowen, Cyrus West1901

Sedalia.

Bard, William Evans.....1901

St. Louis.

Bartmer, Adolph Henry1901

Batt, Bruno1901

Berryman, William Ellis.....1901

Blank, Alois1881

Boehm, Solomon1871

Boesewetter, Richard.....1902

Caspari, Charles Edward.....1902

Claus, Otto Ferdinand.....1901

Duering, Henry Charles1901

Elbrecht, Oscar Herman.....1901

Euler, Frederick Christopher.....1901

Falk, John Charles1900

Fischer, John Frederick Henry.....1901

Frerichs, Frederick William.....1901

Fricke, Frederick Henry.....1901

Friedewald, Hermann Wolfgang.....1901

Funsch, Oliver John1901

Good, James Michener1871

Grewe, Louis Frederick1901

Haffner, Jean Charles1901

Hagee, William Price1901

Hagenow, Theodore Frederick1901

Hahn, Charles William John Henry.....1901

Hassebrock, Henry Fred.....1884

Heinrich, Max Paul.....1901

Hemm, Francis1881

Hinrichs, Carl Gustav1901

Hinrichs, Gustavus Detlef1895

Hinton, Rufus Gray.....1901

Ilhardt, William Kellermann1901

Judge, Charles Rogers.....1901

Klie, George Henry Charles.....1878

Koeneke, Charles Henry.....1901

Lamar, William Robinson1901

Layton, Thomas.....1892

Mallinckrodt, Edward.....1869

May, Charles Charlotte1898

Merrell, George Robert.....1901

Merrem, Charles Daniel1901

Methudy, Joseph Peter.....1901

MEYER, CHRISTIAN FRIED. GOTTLIEB.....1860

Meyer, Theodore Frederick1901

Milliken, John Thomas.....1901

Noll, Martin James1898

Pauley, Frank Charles.....1879

Pfeffer, William Joseph.....1901

Philibert, Leon David1901

Pilkington, William Bouldin1901

Pippert, Nicholas John1902

Reilly, Robert Charles.....1901

Richardson, Samuel William1897

Riley, Russell.....1901

SANDER, ENNO.....1858

SCHEFFER, HENRY WILLIAM.....1863

Schoenthaler, John Paul.....1901

Seitz, Lorenz Aloysius.....1901

Sennewald, Emil August1900

Smith, George Wallace.....1901

Spilker, Hermann Frederick Albert ..1901

Stegner, Emil1901

Stille, Adolph Herman.....1901

Sultan, Frederick William1901

Suppiger, Albert Eugene.....1901

Temm, William Daniel1901

Tontz, George Washington.....1901

Uhlich, Ferdinand Gottlieb1881

Vitt, Rudolph Simon.....1895

Vordick, August Henry1874

Walbridge, Cyrus Packard1901

Wall, Otto Augustus1884

Weber, Peter John1901

West, Courtney Hughes.....1902

WHELPLEY, HENRY MILTON1887

Whitcomb, Frederick Ezekiel.....1888

Wolf, Henry Adam.....1901

Wolff, Edward Henry1901

Wurmb, Theodore Henry.....1890

Webb City.

Thomas, Frank W.....1902

Wright, Charles Lewis1901

Webster Groves, St. Louis Co.

Meisburger, William Joseph.....1900

Mueller, Ambrose1894

Windsor, Henry Co.

Wesner, Henry Clay1901

MONTANA.

Butte, B.T. & N.T.

Rockefeller, Howard.....1900

ROLL OF MEMBER:

NEBRASKA.

<i>Fairbury.</i>	Carslake
Pease, Autumn Vine 1893	
<i>Lincoln.</i>	Dare, Ch
Barth, Henry H. 1901	Jorden, I
<i>Omaha.</i>	Whipple,
Mares, Ferdinand Louis 1897	
Myers, Preston B. 1897	Barrett, C
Schmidt, Joseph H. 1897	Beringer,
Sherman, Charles Rollin 1889	Weiser, V

NEVADA.

<i>Elko.</i>	Doughert
Taber, Joseph Milo 1901	Williams,
<i>Winnemucca.</i>	
Brown, William Ambrose 1893	Frohwein,

NEW HAMPSHIRE.

<i>Derry Depot.</i>	Kent, Her
Bell, Samuel Howard 1890	Oliver, W
<i>Dover.</i>	Stutzlen, I
Rollins, John Francis 1859	
<i>Littleton.</i>	Rockefelle
Robins, Wilbur Fiske 1892	
<i>New Market.</i>	Walker, Jo
Dearborn, George Luther 1853	
<i>Portsmouth.</i>	Willard, Ro
Grace, William Day 1896	KLUSSMANI
Green, Benjamin 1888	Abernethy,
Preston, Andrew Peabody 1881	Foulke, Jan
<i>Somersworth.</i>	Gallagher, J
Hurd, John Charles 1892	Lohmann, I
MOORE, GEORGE 1859	Stein, Edwa
	Vockroth, E
	White, Geor

NEW JERSEY.

<i>Atlantic City,</i>	Kuehne, Cha
Deemer, George Morton Hays 1902	
Ridgway, William Frederick 1902	
Wescott, William Carter 1896	Warn, Willia
<i>Bayonne.</i>	L:
Peterson, John Nelson 1902	Harrison, Wi
<i>Bernardsville.</i>	
Squibb, Charles Fellows 1901	Brown, Willi

Matawan, Monmouth Co.

Slater, Frank Hovey 1882

Medford.

Thorn, Henry Prickett 1879

Montclair.

Wrensch, Henry Ernest, Jr. 1902

Norristown.

CARRELL, EUGENE AYERS..... 1875

Newark.

Betzler, Jacob..... 1880

Coleman, John H..... 1902

Drescher, August Frederick 1902

Eckert, John..... 1902

Foster, John Benjamin 1901

HOLZHAUER, CHARLES 1873

Menk, Charles William..... 1898

Sayre, William Henry..... 1877

Smith, Clarence Pennington..... 1890

Staehle, Louis Lorenz 1898

Stamford, William Harrison 1876

Van Winkle, Abraham 1871

Wuenssch, Charles..... 1898

New Brunswick.

Kilmer, Frederick Barnett 1886

Perth Amboy.

Parisen, George Warren 1892

Phillipsburg.

Anewalt, Ellsworth Quincy..... 1901

Plainfield.

Ollif, James Henry..... 1867

Riverside.

Pine, Warren Carleton 1897

South Amboy.

JACQUES, GEORGE WASHINGTON 1869

Verona, Essex Co.

Rich, William Pitt..... 1902

NEW MEXICO.

Fort Stanton.

Maguire, Edward Sylvester..... 1897

Morris, George Alexander 1902

NEW YORK.

Albany.

Bradley, Theodore James 1896

Dillenback, Garrett Van der Veer 1902

Gaus, Charles Henry..... 1879

Husted, Alfred Birch..... 1879

Michaelis, Gustavus..... 1882

Walker, William John..... 1880

*Auburn.*Adam^s, Arthur Ellison..... 1902*Binghamton.*

Nelson, Burt Everett 1902

Brooklyn.

Anderson, William Christine 1900

Bartley, Elias Hudson..... 1893

Brooks, George Washington 1879

Brundage, Albert Harrison..... 1892

Colen, James Austin 1892

DeForest, William Pendleton..... 1879

DeJonge, Cornelius 1899

Dennin, Charles..... 1875

Dennin, Edwin Clinton..... 1892

Dewender, William Henry 1896

Douglass, Henry 1875

Dunn, John Augustus 1867

Eccles, Robert Gibson.. 1885

Englander, Samuel 1899

FOUGERA, EDMUND CHARLES HENRY. 1890

Levy, Adolph..... 1877

Lo Sardo, Antonino..... 1902

May, Louis 1902

McElhenie, Thomas DeArmond..... 1872

McMahon, Joseph..... 1897

OWENS, RICHARD JOHN 1860

Post, Arthur Edward..... 1901

Raubenheimer, Otto..... 1902

Remington, Joseph Percy..... 1901

Rosenzweig, Benjamin..... 1898

Schleussner, Charles Frederick 1902

Snyder, Ambrose Chancellor 1867

Squibb, Edward Hamilton 1882

Tuthill, Frederic Percival 1899

Waldner, Paul Jacob..... 1900

Webber, Joseph LeRoy 1886

Werner, Rudolph Carl..... 1892

Buffalo.

Gregory, Willis George..... 1886

Hayes, Horace Phillips 1880

Lockie, James Alexander	1896	Allison
Rano, Charles Orlando	1866	Alpers
Reimann, George	1902	Amen
Stoddart, Thomas	1900	Aquar
<i>Catskill.</i>		Balser,
Du Bois, William Laneman	1880	Bigelo
<i>College Point.</i>		Billing
Hartz, Johann Daniel August	1902	Boeddi
<i>Corning.</i>		Brucke
Cole, Victor Le Roy	1890	Chand
<i>Croton-on-Hudson.</i>		Coblen
Henry, Charles (Dworniczak)	1881	Cook,
<i>Dannemora.</i>		Dagge
Sloss, Robert Audley	1901	Diekm
<i>Dunkirk.</i>		Eaton,
Davis, Eugene Miller	1892	Erb, Cl
<i>Elmira.</i>		Ewing,
HOLMES, CLAYTON WOOD	1873	Faber,
<i>Fillmore, Allegany Co.</i>		Fairchi
Ridgway, Lemuel Augustus	1882	Fairchi
<i>Fishkill-on-Hudson.</i>		Fraser,
Moith, Augustus Theodore	1860	Gable,
<i>Flushing.</i>		Gahn, F
Hepburn, John	1873	Gane, F
<i>Geneseo, Livingston Co.</i>		Gardne
Rogers, Arthur Henry	1882	Geisler,
<i>Groton.</i>		Goldma
Rhodes, Charles Orman	1895	Gregori
<i>Jamaica, Queens Co.</i>		Haddad
Baylis, Lewis Fosdick	1880	Hauens
Goodale, Harvey Galusha	1879	Haynes,
Peck, George Lyman	1883	Heyden
<i>Middletown.</i>		Hirsema
KING, JAMES THEODORE	1859	Hitchco
Rogers, William Henry	1869	Hopkins
<i>Mount Vernon.</i>		Hudnut,
Blackmore, Henry Spencer	1896	Jelliffe,
Rauschenberg, Sidney	1900	Jungma
Stone, Clarence George	1901	Kalish,
<i>Newburg.</i>		Kalish,
Chapman, Isaac Close	1887	Keenan,
		Kennedy
		Kent, Ro
		Kirchgass
		Lampa,
		Lehritter
		Lovis, H
		MAIN, T
		Mariams
		Mayo, C
		McIntyre

McKesson, George Clinton.....	1888	Muench, William.....	1899
McKesson, John, Jr.....	1867	Snow, Charles Wesley.....	1876
MILHAU, EDWARD LEON.....	1858		
Miller, Herman.....	1897	<i>Utica.</i>	
<i>Mokwits, Ernest</i>	1867	Blaikie, William.....	1879
Murray, Benjamin Lindley.....	1896	Watson, William, Jr.....	1902
O'Neil, Henry Maurice.....	1879		
Parsons, Charles West.....	1899	<i>Wellsville, Allegany Co.</i>	
Pennock, Edward.....	1868	Hall, Edwin Bradford.....	1879
Plaut, Albert.....	1894		
Pringle, James Maxwell.....	1902	<i>Yonkers.</i>	
Quackinbush, Benjamin Franklin....	1886	Petsche, Franz Fried. Bismarck Wilhelm.	1892
RAMSPERGER, GUSTAVUS.....	1860		
Reynolds, Charles Edward.....	1897	NORTH CAROLINA.	
Robinson, William Josephus Marir....	1902	<i>Asheville.</i>	
RUNYON, EDWARD WHEELOCK.....	1875	Pfaffin, Henry Adolph.....	1892
Rusby, Henry Hurd.....	1890	Smith, Whitefoord Gamewell.....	1892
Sayre, Edward Augustus.....	1877		
Schieffelin, William J.....	1892	<i>Chapel Hill.</i>	
Schimpf, Henry William.....	1894	Howell, Edward Vernon.....	1900
Schmid, Henry.....	1887		
Schmidt, Ferdinand Traugott.....	1886	<i>Charlotte.</i>	
SEABURY, GEORGE JOHN.....	1876	Walker, Thomas Arthur.....	1900
Sieker, Ferdinand August.....	1893	Wearn, William Henry.....	1888
SKELLY, JAMES JOSEPH.....	1866	Williams, Morrison Patton.....	1902
Smith, Reuben Randolph.....	1890		
Stewart, Aaron Walter.....	1902	<i>Durham, Orange Co.</i>	
Takamine, Jokichi.....	1898	Vaughan, Perry Wyche.....	1882
Tsheppe, Adolph.....	1876		
White, Charles Hugh.....	1902	<i>Fayetteville.</i>	
Wichelns, Frederick.....	1881	Horne, Warren Winslow.....	1902
Wickham, William Hull.....	1870		
		<i>Morganton.</i>	
<i>Oswego.</i>		Leslie, William Augustus.....	1902
Butler, Charles Henry.....	1887		
		<i>New Bern.</i>	
<i>Plattsburg.</i>		Bradham, Caleb Davis.....	1902
Hitchcock, John E.....	1892		
		<i>Raleigh.</i>	
<i>Port Henry.</i>		Hicks, Henry Thomas.....	1898
Smith, Edward Salvister.....	1890	Simpson, William.....	1873
<i>Richfield Springs.</i>		<i>Scotland Neck.</i>	
Smith, Willard Alfred.....	1880	Whitehead, Eugene Thomas.....	1900
<i>Saratoga Springs.</i>		<i>Tarboro.</i>	
FISH, CHARLES FREDERICK.....	1866	Macnair, Whitmel Horne.....	1898
		Zoeller, Edward Victor.....	1878
<i>Stapleton, Staten Island.</i>			
Miller, Charles.....	1897	<i>Wilmington.</i>	
Roehrig, Albert Michael.....	1902	Hardin, John Haywood.....	1881
<i>Syracuse.</i>		NORTH DAKOTA.	
Dawson, Edward Seymour, Jr.....	1876	<i>Jamestown.</i>	
		White, Herbert Eugene.....	1897

ROLL OF MEMBERS.

<i>Lakota.</i>		McKenzie, Hug
St. John, Sydney Sylvester	1897	Miller, Frederick
<i>OHIO.</i>		Myers, Daniel .
<i>Cambridge.</i>		Oster, Frank Ch
Ogier, John Morrison	1895	Placak, Harry .
<i>Canton.</i>		Schoenbut, Chris
Koth, Charles Robert	1900	Selzer, Eugene R
<i>Chillicothe.</i>		Sherwood, Henry
Howson, Arthur Bayshawe	1886	Sords, Thomas V
<i>Cincinnati.</i>		Stecher, Frederic
Cone, Earl Hobart	1901	Voss, George Wi
DeLang, Alfred	1887	<i>Co</i>
Fennel, Charles Theodore Piderit	1886	Ink, Charles Ellio
Fieber, Gustavus Adolphus	1893	<i>C</i>
<i>Gordon, William John Maclester</i>	1854	Bruck, Philip Her
Greyer, Julius	1880	Byrne, John . . .
LLOYD, JOHN URI	1870	Dye, Clair Albert.
Merrell, Charles George	1888	Hatton, Edgar Me
Merrell, George	1879	Hatton, Ellmore V
Rogers, Edward	1902	Huston, Charles..
Ruppert, John	1880	Kaemmerer, Willi
Serodino, Herman	1880	Kauffman, George
Simonson, William	1887	Matson, George Hi
Wetterstroem, Albert Frederick Charles.	1888	Ogier, William Rol
Wetterstroem, Theodore David	1897	Rauschkolb, John .
YORSTON, MATTHEW MACKAY	1864	Schueller, Frederic
Zuenkeler, John Ferdinand	1887	Wendt, William Ca
<i>Cleveland.</i>		<i>Conneaut,</i>
Army, Harry Vin	1891	Symonds, Arthur H
Benfield, Charles William.	1893	<i>De</i>
Brown, Charles Malvern.	1902	<i>De</i>
Cobb, Ralph Lathrop	1883	King, Ferdinand He
Drach, George Louis	1902	<i>Fin</i>
Drake, Wallace Clinton	1902	Firmin, John Curtis.
Feil, Joseph	1885	<i>Grand Rap</i>
Fischer, Henry John	1902	Thurston, Azor.....
Gleim, John Christopher	1893	<i>Hill</i>
Haake, William Henry	1893	Garrett, Oscar Newton
Hankey, William Tabor	1902	<i>Log</i>
Hannan, Owen Burdette	1893	<i>Harrington, Frank...</i>
Hatcher, Robert Anthony	1902	<i>Middl</i>
Hechler, George Lewis	1882	Johnson, Charles Bray
Hopp, Lewis Christopher	1876	<i>Nava</i>
Johns, William George	1902	GROSSKLAUSS, JOHN F
Krause, John	1900	
Kuder, William Frank	1893	
Lehr, Philip	1885	

<i>New Philadelphia.</i>		<i>Braddock.</i>	
Miller, William Harvey.....	1898	Hollander, Joseph Maurice	1901
<i>Scio.</i>		<i>Builer.</i>	
Beal, James Hartley.....	1892	Boyd, Charles Newton.....	1900
<i>Springfield.</i>		<i>Carlisle.</i>	
Casper, Thomas Jefferson.....	1867	Horn, Wilbur Fisk.....	1876
Siegenthaler, Harvey Newton.....	1882	<i>Chambersburg.</i>	
<i>Wooster.</i>		Keefer, Charles DeWalt	1891
OHLIGER, LEWIS PHILIP.....	1871	<i>Connellsville.</i>	
<i>Youngstown.</i>		Berryhill, Henry Pennick.....	1890
Cassaday, Orlin Ulysses.....	1899	<i>Du Bois.</i>	
OKLAHOMA TERRITORY.		Hay, Charles La Mar	1898
<i>Guthrie.</i>		<i>Girardsville.</i>	
Lillie, Foress Ball.....	1900	Donaghue, James.....	1900
<i>Hennessey.</i>		Donaghue, Theresa Veronica.....	1900
Dinkler, Frank A.....	1900	<i>Harrisburg.</i>	
<i>McLeod.</i>		GEORGE, CHARLES THEODORE	1873
Golden, Lee Hampton.....	1900	Gorgas, George Albert.....	1884
<i>Oklahoma City.</i>		Gross, Edward Ziegler.....	1883
Weaver, Francis Marion.....	1900	Miller, Jacob Augustus.....	1873
<i>Stroud.</i>		Smith, Benjamin Franklin	1892
Burton, John Clement.....	1902	<i>Haverford.</i>	
OREGON.		Harbaugh, Duncan James.....	1902
<i>Ashland, Jackson Co.</i>		Harbaugh, Wilson Linn	1896
McNair, John Sydenham.....	1902	<i>Huntingdon Valley, Montgomery Co.</i>	
<i>Portland.</i>		Robinson, Ernest Frankish.....	1889
Blumauer, Louis.....	1889	<i>Johnstown.</i>	
Robertson, Felix Otey.....	1890	Griffith, Charles.....	1900
<i>The Dalles.</i>		Young, Charles.....	1902
Blakeley, George Clarence	1892	<i>Lancaster.</i>	
PENNSYLVANIA.		Heinitsh, Sigmund William.....	1889
<i>Allegheny City.</i>		<i>Langhorne.</i>	
Caldwell, Joseph France	1902	Hancock, Charles West.....	1868
Einstein, Morris.....	1900	<i>Lansford, Carbon Co.</i>	
Gleghorn, James Seymour.....	1900	Renshaw, Thomas Worthington	1901
Johnson, Ralph Henry	1901	<i>Lebanon.</i>	
Minnick, William George.....	1902	LEMBERGER, JOSEPH LYON	1858
<i>Beaver, Beaver Co.</i>		Redsecker, Jacob Henry.....	1881
Andriessen, Hugo	1875	<i>Manheim, Lancaster Co.</i>	
		Ruhl, Harry Fry	1902
		<i>McKeesport.</i>	
		Rodemoyer, William Edward.....	1901

Judd, Albert Floyd 1901
 Koch, Julius Arnold 1892
 Lohmeyer, Henry Louis. 1900
 Schaeffer, Emil August 1900

Pottstown.

Byers, Huizinga Clarence 1900

Pottsville.

Diebert, Thomas Irvin 1882

Reading.

Stein, Jacob Henry 1902

Ziegler, Philip Milton 1867

Scranton.

Davies, John Jenkins 1902

Thomas, Daniel Judson 1900

Sharpsburg.

Patrick, Elmer Alcorn 1900

Towanda.

PORTER, HENRY CARROLL 1872

West Chester.

Evans, Joseph Spragg 1877

Williamsport.

Cornell, Edward Augustus 1873

Smith, Edward W. 1902

York.

Alexander, Charles Ellis 1899

Patton, John Franklin 1880

Weakley, William Stair. 1902

RHODE ISLAND.

Narragansett Pier.

Tobin, John Martin 1887

Newport.

Downing, Benjamin Franklin, Jr. 1886

Wood, John William 1897

Providence.

Blanding, William Oliver 1894

Cone, John Wright 1876

Crawford, Frank Eugene 1902

Daggett, Charles Henry 1902

Greene, William Ray 1883

Lyon, George Calvin 1899

O'Hare, James 1888

Pearce, Howard Anthony 1894

Potter, William Robert 1894

Wood, Mason Bowen 1882

Westerly.

Collins, Albert Burlingame 1882

Collins, Mary Elizabeth 1902

Woonsocket.

Jackson, Frank Anthony 1900

Simmons, Frank Birtles 1897

SOUTH CAROLINA.

Anderson.

Ligon, John Temple 1900

Camden.

Zemp, William Robinson 1900

Charleston.

Aimar, Charles Pons 1879

* Barbot, Julian Augustus 1902

Smith, Francis Marion 1902

Speissegger, Walter Louis 1902

Columbia.

Thomas, Oscar Ernest 1882

Gaffney.

Cureton, George Douglas 1902

Greenville.

Carpenter, Alfred Baxter 1898

Seneca.

Lunney, William John 1902

SOUTH DAKOTA.

Bristol.

Mack, George Christian 1902

Brookings.

Cornell, Edward Cloyer 1902

Tidball, James Taylor 1902

Gayville.

Fulton, Peter MacMullen 1902

Madison.

Schutz, Chris. 1902

Wakonda.

Gilchrist, Nellis Remer 1901

Watertown.

Jones, David Franklin 1895

* Died February, 1903,

Yankton.

Brecht, Frederick Adolph.....1895

TENNESSEE.

Chattanooga.

Greve, Charles Mathias.....1887

Voight, Joseph Frederick.....1893

Columbia.

Rains, Aris Brown.....1894

Humboldt.

Thweatt, Archibald.....1900

Knoxville.

Rosenthal, David Abraham.....1894

Memphis.

Holt, Edwin Merrimon....1902

Mayo, Frederick William.....1901

ROBINSON, JAMES SCOTT.....1869

'Treherne, John Curtis.....1894

Nashville.

Burge, James Oscar.....1878

McGill, John Thomas.....1900

Ruddiman, Edsel Alexander.....1894

Shwab, George Augustus.....1901

TEXAS.

Austin.

Neville, William Rust.....1901

Dallas.

De Lorenzi, Albert.....1890

Eberle, Eugene Gustavus.....1896

Gaiveston.

Cline, Raoul René Dannel.....1898

Orton, Ingomar Francois.....1891

Hearne.

Hazlett, James Lupe.....1900

Houston.

Burgheim, Jacob.....1892

Hoffmann, Herman.....1902

Marshall.

Richardson, Edwin Sexton.....1902

McKinney, Callin Co.

Dulaney, Joseph Field.....1902

Pittsburg.

Greer, Samuel Rufus.....1900

San Antonio.

Schmitt, George Joseph Francis.....1890

Sherman.

Greiner, William Edward.....1892

Taylor.

Thames, Joseph Jefferson.....1895

Velasco.

Roeller, Edward Frank.....1902

Waelder, Gonzales Co.

Brookes, Virginia Cade.....1901

VERMONT.

Brandon.

Hopkins, Zerah Blaisdell.....1900

Montpelier.

Blakely, Collins.....1899

Poole, William Everett.....1902

Slade, Harry Allen.....1899

Terrill, Willis Ethel.....1899

Northfield.

Dunham, Andrew Allen.....1901

Rutland.

Higgins, Albert Warren.....1895

St. Albans.

Dutcher, Alfred Luther.....1892

St. Johnsbury.

Bingham, Charles Calvin.....1875

VIRGINIA.

Lynchburg.

Goldsborough, Charles Henry.....1898

Newport News.

Klor, Alexander Edward George.....1899

Norfolk.

Allen, Grafton Cleveland.....1902

MacRae, John Young.....1894

May, Edward.....1897

McLarty, Colin.....1898

Pamplin City, Appomattox Co.

Walker, Emmett Edward.....1900

Richmond.

Baker, Thomas Roberts.....1856

Barksdale, George Edwards.....1900
 Briggs, Andrew Gessner1890
 Harrison, Richard Heth Munford....1895
 Harrison, Robert Lucius.....1900
 Miller, Turner Ashby1894
 Reade, Frank Marshall.....1900
 Scott, William Henry1873
 Snook, William Howard... ..1900

Suffolk.

Hall, Joseph Patten.....1900

WASHINGTON.

La Conner, Skagit Co.

Joergensen, Gerhard Johan Carl Sophus. 1889

New Whatcom.

Nicholson, Edgar Lawrence.....1900

Port Townsend.

Troxler, Robert Fulton1902

Pullman.

Watt, George Henry.....1896

Seattle.

Bolink, Elebertus.....1902

Bories, Emil1902

Holmes, Henry Elliott1880

Osseward, Cornelius1897

Snohomish.

Wilbur, Lot.....1896

Tacoma.

Gamer, Albert Charles C.....1902

WEST VIRGINIA.

Wheeling.

Williams, William Hudson.....1880

WISCONSIN.

La Crosse.

Beyschlag, Charles.....1880

Madison.

Fischer, Richard.....1901

Kremers, Edward.....1887

Schreiner, Oswald1900

Mayville, Dodge Co.

Sauerhering, Rudolph Aurelius1884

Milwaukee.

Dadd, Robert Morrow1896

DRAKE, JOHN RANSOM1800

Frank, Hermann Otto.....1898

Kettler, Edward, Jr.....1896

Kienth, Hans.....1884

Raeuber, Edward Gottfried.....1900

Ruenzel, Henry Gottlieb.....1892

Schrank, Charles Henry1876

Neillsville.

Sniteman, Charles Clarence1881

Wauertown.

Eberle, Herman Theodore1901

DOMINION OF CANADA.

MANITOBA.

Winnepeg.

Flexon, Charles1897

NEW BRUNSWICK.

St. John.

Paddock, Morris Venner.....1902

NOVA SCOTIA.

Halifax.

Simson, Francis Cook1876

ONTARIO.

Hamilton.

Clark, John Alexander.....1890

Orangeville.

Turner, Adam1902

Ottawa.

SAUNDERS, WILLIAM1860

Parkhill.

Roberts, James Frederick1901

Pictou.

Case, Edmund Wendall1901

Straford.

WAUGH, GEORGE JAMES1862

Toronto.

Gibbard, George Eakins1902

Heebner, Charles Frederick1894

QUEBEC.*Montreal.*

Baridon, Louis Richard	1890
Gray, Henry Robert	1867
Lachance, Seraphin	1888
Lancot, Henri Raymond	1894
Morrison, Joseph Edward	1888

St. Hyacinthe.

St. Jacques, Gaston	1900
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Three Rivers.

Williams, Richard Wellington	1883
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MEMBERS RESIDING IN FOREIGN COUNTRIES (*except Canada*).

Bowen, William Africanus, Mombasa, British East Africa	1897
Graham, Clarence Montrose, Manila, P. I.	1897
Heyl, James Bell, Hamilton, Bermuda	1863
Holsendorf, Benjamin Ellis, Havana, Cuba	1902
Jacobs, Charles Christian, Sancti Spiritus, Cuba	1901
Long, John Pomfret, Isabela de Babilon, P. I.	1901
Martin, Nicholas Henry, Gateshead on Tyne, England	1891
Ortiz, Miguel Alvarez, Havana, Cuba	1902
POWER, FREDERICK BELDING, London, England	1872
RUMSKY, SAMUEL LOUIS, Honolulu, Hawaiian Islands	1876
WELLCOME, HENRY SOLOMON, London, England	1875

MEMBERS WHOSE RESIDENCE IS UNKNOWN.

Smith, James Atkinson	1902
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NOTE.—Names of life members whose residence has been unknown for five consecutive years, are no longer published in the above list, in accordance with the action of the Council approved at the forty-eighth annual meeting. (See Proceedings 1900, p. 18.)

ALPHABETICAL LIST OF MEMBERS.

HONORARY MEMBERS.

- Attfield, Dr. John, F. R. S., Watford, England.
Carteighe, Michael, F. I. C., 180 New Bond St., London, W., England.
Hoffmann, Dr. Frederick, Schlüter Strasse 64, Charlottenburg, Berlin, Germany.
Holmes, E. M., F. L. S., 17 Bloomsbury Square, London, W. C., England.
Hooper, David, F. I. C., F. C. S., Indian Museum, 1 Sudder St., Calcutta, India.
Ince, Joseph, F. L. S., Glenholme, 13 Alfred Road, Acton, W., London, England.
Martenson, Staatsrath J. von, Kinderhospital des Prinzen von Oldenburg, St. Petersburg, Russia.
Schacht, Dr. Karl, 56 Mittelstrasse, Berlin, N. W., Germany.
Schaer, Dr. Edward, Professor of Pharmacy, pharmaceutisches Institut der Universität, Strassburg, Germany.
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany.
(1168)

ACTIVE MEMBERS.

Members are requested to notify the General Secretary of errors or inaccuracies in the following list. The Association will not replace volumes of Proceedings lost through changes of residence of which the General Secretary has not been notified. See Proceedings, 1866, p. 66.

Abbett, William A., 201 W. Superior st., Duluth, Minn.	Appelbaum, Jerome, Northern ave. & Elm st., Pueblo, Colo.
Abernethy, Maxwell, 188 Newark ave., Jersey City, N. J.	Appleton, William R., El Dorado, Ark.
Adamick, Gustave H., 189 E. Madison st., Chicago, Ill.	Aquaro, Joseph, 202 Spring st., New York, N. Y.
Adams, Arthur E., 16 Westlake ave., Auburn, N. Y.	Arbery, Lorimer, 106 N. Main st., Hutchinson, Kan.
Aimar, Charles P., 411 King st., Charleston, S. C.	Arnett, William N., 22 W. Washington st., Indianapolis, Ind.
Allen, E. Floyd, 1538 Nicollet ave., Minneapolis, Minn.	Army, Harry V., 782 Republic st., Cleveland, O.
Allen, Grafton C., U. S. Custom House, Norfolk, Va.	Aughinbaugh, David C., 54 W. Washington st., Hagerstown, Md.
Allen, William H., 307 Trumbull ave., Detroit, Mich.	Averill, William H., 435 Main st., Frankfort, Ky.
Alexander, Chas. E., 961 N. George St., York, Pa.	Axness, Ole M., Pelican Rapids, Otter Tail Co., Minn.
Allison, William O., 100 William st., New York, N. Y.	Baer, Jacob M., 1400 Spruce st., Philadelphia, Pa.
Alpers, William C., 45 W. 31st st., New York, N. Y.	Bailey, Frederick, P. O. Box 314, Lowell, Mass.
Amend, Bernard G., 205 3d ave., New York, N. Y.	Baird, Julian W., 102 St. Botolph st., Boston, Mass.
Anderson, Samuel, 48 Front st., Bath, Me.	Baker Edwin, Bridge st., Shelburne Falls, Mass.
Anderson, Wm. C., 320 Lafayette ave., Brooklyn, N. Y.	Baker, Howard S., 509 4th st., Sioux City, Ia.
Andreen, Carl, 1504 4th st., Sioux City, Ia.	Baker, T. Roberts, Cor. Lester & Ash sts., Richmond, Va.
Andriessen, Hugo, P. O. Box 57, Beaver, Beaver Co., Pa.	Ball, Charles E., 227 High st., Holyoke, Mass.
Anewalt, Ellsworth Q., 142 S. Main st., Phillipsburg, N. J.	Ballagb, Wilfred T., S. E. cor. Square, Nevada, Mo.
Anglum, John, 1463 Larimer st., Denver, Colo.	BALLARD, JOHN W., 106 W. 2d st., Davenport, Ia

- Balser, Gustavus,
 137 Avenue B, New York, N. Y.
 Bamford, Melvin W.,
 1827 Pacific st., Tioga, Philad'a, Pa.
 Barbat, Josephine E. (Miss),
 1310 Folsom st., San Francisco, Cal.
 *Barbot, Julian A.,
 54 Broad st., Charleston, S. C.
 Bard, William E.,
 108 W. Main st., Sedalia, Mo.
 Baridon, Louis R.,
 1703 St. Catharine st., Montreal, Can.
 Barksdale, George E.,
 3900½ Williamsburg ave., Richmond, Va.
 Barnett, Joel J.,
 509 W. Lombard st., Baltimore, Md.
 Barrett, Chas. L.,
 601 Berkley st., Camden, N. J.
 Bartells, George C.,
 130 East State st., Camp Point, Ill.
 Barth, Geo. F.,
 State st., North Alton, Ill.
 Barth, Henry H.,
 929 O st., Lincoln, Neb.
Bartlett, N. Gray,
 22d st. & Indiana ave., Chicago, Ill.
 Bartley, Elias H.,
 21 Lafayette ave., Brooklyn, N. Y.
 Bartmer, Adolph H.,
 3180 Easton ave., St. Louis, Mo.
 Base, Daniel,
 329 N. Schroeder st., Baltimore, Md.
 Bassett, Charles H.,
 109 Arch st., Boston, Mass.
 Batt, Bruno,
 948 Chouteau ave., St. Louis, Mo.
 Batt, Herman,
 52 Dearborn st., Chicago, Ill.
 Battle, Orrin McR.,
 Fulton, Ark.
 BAUER, LOUIS G.,
 635 N. 5th st., Philadelphia, Pa.
 Baur, Jacob,
 76 Illinois st., Chicago, Ill.
 Baylis, Lewis F.,
 388 Fulton st., Jamaica, Queens Co., N. Y.
 Bayly, Charles A.,
 Grant ave. & Sutter st., San Francisco, Cal.
 Beal, James H.,
 Scio, O.
 Beck, Henry M.,
 246 Sutter st., San Francisco, Cal.
 Beck, John G.,
 1538 N. Caroline st., Baltimore, Md.
 Becker, Charles L.,
 304 Main st., Ottawa, Kan.
 Behrens, Emil C. L.,
 807 S. Halstead st., Chicago, Ill.
 Beitenman, William W.,
 2d st. & Bennett ave., Cripple Creek, Colo.
 Bell, Emil R.,
 Preston & Breckenridge sts., Louisville, Ky.
 Bell, S. Howard,
 Lock Box 121, Derry Depot, N. H.
 Benfield, Charles W.,
 Wilson & Payne aves., Cleveland, O.
 Bennett, James N.,
 853 Main st., Hartford, Conn.
 Benton, Wilber M.,
 325 Main st., Peoria, Ill.
 Berger, Ernest,
 P. O. Box 566, Tampa, Fla.
 Beringer, George M.,
 501 Federal st., Camden, N. J.
 Bernheim, Moses R.,
 400 Post st., San Francisco, Cal.
 Bernstein, Michel,
 Texas ave. & Murphy st., Shreveport, La.
 Berryhill, Henry P.,
 Buttermore Block, Connellsville, Pa.
 Berryman, William E.,
 Union Station, St. Louis, Mo.
Best, John,
 1 German Block, Central City, Colo.
 Bethea, Oscar W.,
 4th st. & 22d ave., Meridian, Miss.
 Betsler, Jacob,
 593 Orange st., Newark, N. J.
 Beyschlag, Charles,
 503 Main st., La Crosse, Wis.
 Bigelow, Clarence O.,
 102 Sixth ave., New York, N. Y.
 Billings, Henry M.,
 28 W. 50th st., New York, N. Y.
 Bingham, Charles C.,
 37 Main st., St. Johnsbury, Vt.
 BIROTH, HENRY,
 481 25th st., Chicago, Ill.
 Blackmore, Henry S.,
 206 S. 9th ave., Mt. Vernon, N. Y.
 Blaikie, William,
 202 Genesee st., Utica, N. Y.
 BLAKE, JAMES E.,
 96 N. 2d st., New Bedford, Mass.

* Died February, 1903.

- Blakeley, George C.,
175 2d st., The Dalles, Ore.
- Blakely, Collins,
5 State st., Montpelier, Vt.
- Blanding, Wm. O.,
54 Weybosset st., Providence, R. I.
- Blank, Alois,
1353 S. 5th st., St. Louis, Mo.
- Blumauer, Louis,
4th & Morrison sts., Portland, Ore.
- Bobbitt, James H.,
821 N. Fremont ave., Baltimore, Md.
- Boeddiker, Otto,
954 6th ave., New York, N. Y.
- Boehm, Solomon,
800 Morgan st., St. Louis, Mo.
- Boerner, Emil L.,
113 Washington st., Iowa City, Ia.
- Boesewetter, Richard,
1109 Madison st., St. Louis, Mo.
- Bohmansson, Robert H.,
Arcata, Humboldt Co., Cal.
- Bolink, Elebertus,
118 2nd ave., S., Seattle, Wash.
- Bond, Jackson N.,
408 Broadway, Mt. Vernon, Ill.
- Bond, John B.,
Main & 5th sts., Little Rock, Ark.
- Bond, John B., Jr.,
323 E. Markham st., Little Rock, Ark.
- Bonnette, J. Valarus,
Front & Main sts., Pollock, La.
- Borell, Henry A.,
2043 Chestnut st., Philadelphia, Pa.
- Bories, Emil,
Room 27 Haller Bldg., Seattle, Wash.
- BORING, EDWIN M.,
N. E. cor. 10th & Fairmount ave., Phila, Pa.
- Bostick, Elmer E.,
3600 N. 5th st., Philadelphia, Pa.
- Bowen, Cyrus W.,
Plattsburg, Mo.
- Bowen, William A.,
Mombasa, British East Africa.
- Bowerman, Kenneth B.,
500 Sutter st., San Francisco, Cal.
- Boyd, Charles N.,
Main st., Butler, Pa.
- Boyd, George W.,
121 Second st., N. E., Washington, D. C.
- Boyden, Edward C.,
Joy & Myrtle sts., Boston, Mass.
- Boyken, John W.,
250 Sutter st., San Francisco, Cal.
- Boynton, Herschell,
74 Main st., Biddleford, Me.
- Brack, Charles E.,
Ensor & Forrest sts., Baltimore, Md.
- Bradbury, Wymond H.,
808 I st., N. W., Washington, D. C.
- Bradham, Caleb D.,
Pollock & Middle sts., New Bern, N. C.
- Bradley, Theodore J.,
Albany Coll. Pharm., Albany, N. Y.
- Brandenberger, Adolph,
130 E. High st., Jefferson City, Mo.
- Brecht, Frederick A.,
209 3d st., W., Yankton, S. Dak.
- Breunert, August,
1335 Grand ave., Kansas City, Mo.
- Brewer, Howard D.,
19 Oxford st., Worcester, Mass.
- Brickman, Arthur O.,
500 E. Baltimore st., Baltimore, Md.
- Briggs, Andrew G.,
204 Howitzer Place, Richmond, Va.
- Brigham, Lawrence S.,
25 Dexter ave., Montgomery, Ala.
- Brisley, Harry,
Prescott, Ariz.
- Brookes, Virginia C. (Miss),
Waelder, Gonzales Co., Tex.
- Brooks, George W.,
1161 Myrtle ave., Brooklyn, N. Y.
- Brown, Albert E.,
14 N. Water st., Mobile, Ala.
- Brown, Chas. M.,
Cleveland State Hospital, Cleveland, O.
- Brown, George S.,
2801 St. Charles ave., New Orleans, La.
- Brown, William A.,
Eagle Drug Store, Winnemucca, Neb.
- Brown, William T.,
Box 19, Madison, N. J.
- Bruck, Philip H.,
961 S. High st., Columbus, O.
- Brucker, Carl,
37 Barclay st., New York, N. Y.
- Brundage, Albert H.,
1073 Bushwick ave., Brooklyn, N. Y.
- Brunner, Norman I.,
4th & Arch sts., Macon, Ga.
- Buck, John L.,
25 County Road, Chelsea, Mass.

- Burg, John D.,
4th & Brown sts., Philadelphia, Pa.
- Burge, James O.,
Church & High sts., Nashville, Tenn.
- Burghheim, Jacob,
1019 Congress ave., Houston, Tex.
- Burke, William H.,
153 Grand River ave., Detroit, Mich.
- Burkhardt, Mark A.,
Third & St. Clair sts., Dayton, O.
- Burnett, George G.,
8 Turk st., San Francisco, Cal.
- Burnham, Alfred A., Jr.,
459 Dudley st., Boston, Mass.
- Burns, Edwin M.,
328 S. Superior st., Mason City, Ia.
- Burrough, Horace,
509 W. Lombard st., Baltimore, Md.
- Burrough, Horace, Jr.,
509 W. Lombard st., Baltimore, Md.
- Burton, John C.,
3d st., Stroud, Okla. Terr.
- Butler, Charles H.,
182 W. 1st st., Oswego, N. Y.
- Butler, Freeman H.,
391 Middlesex st., Lowell, Mass.
- Byers, Huizinga C.,
28 King st., Pottstown, Pa.
- Byrne, John,
200 N. High st., Columbus, O.
- Caldwell, Joseph F.,
17 Garrison ave., Allegheny City, Pa.
- Calvert, John,
Kearney & Clay sts., San Francisco, Cal.
- Campbell, Albert A.,
235 Rondo st., St. Paul, Minn.
- Campbell, Chas. B.,
200 E st., N. E., Washington, D. C.
- Campbell, George D.,
Main st., Lonaconing, Md.
- Campbell, Milton,
426 S. 13th st., Philadelphia, Pa.
- Campbell, Theodore,
2101 N. 63d st., Overbrook, Philad'a., Pa.
- CANDIDUS, PHILIP C.,
Mobile, Ala.
- CANNING, HENRY,
109 Green st., Boston, Mass.
- Capdau, Pierre A.,
940 Elysian Fields ave., New Orleans, La.
- Capper, Wm. E.,
31 School st., Boston, Mass.
- Carlson, Swan B.,
Wilmar, Minn.
- Carpenter, Alfred B.,
Main st., Greenville, S. C.
- CARRELL, EUGENE A.,
South st., Morristown, N. J.
- Caralake, George M.,
Farnsworth ave., Bordentown, N. J.
- Carter, Frank H.,
772 Massachusetts ave., Indianapolis, Ind.
- Case, Edmund W.,
Main st., Pictou, Ontario, Can.
- Caspari, Charles, Jr.,
Maryland Coll. Pharm., Baltimore, Md.
- Caspari, Chas. E.,
Box 246, Bremen Station, St. Louis, Mo.
- Caspari, William, Jr.,
1600 Druid Hill ave., Baltimore, Md.
- Casper, Thomas J.,
41 E. Main st., Springfield, O.
- Cassaday, O. U.,
14 W. Federal st., Youngstown, O.
- Castlehun, Karl,
2 State st., Newburyport, Mass.
- Chandler, Charles F.,
cor. 116 st. & Amsterdam ave., New York, N. Y.
- Chapman, Isaac C.,
111 Water st., Newburgh, N. Y.
- Cheatham, Thomas A.,
Mulberry & 3d sts., Macon, Ga.
- Chesnutt, James H.,
12 Hickory st., Hot Springs, Ark.
- Civins, Albert I.,
5th & Lombard sts., Philadelphia, Pa.
- Clafin, Walter A.,
Harvard Square, Cambridge, Mass.
- Clark, Alfred W.,
801 Santa Fe ave., Denver, Colo.
- Clark, John A.,
East King st., Hamilton, Ontario, Can.
- Claus, Otto F.,
1116 Montgomery ave., St. Louis, Mo.
- Cleveland, Jule M.,
Elberton, Ga.
- Cliffe, Wm. L.,
2778 Kensington ave., Philadelphia, Pa.
- Cline, Raoul R. D.,
1018 Market st., Galveston, Tex.
- Cobb, Ralph L.,
112 Superior st., Cleveland, O.
- Coblentz, Virgil,
115 W. 68th st., New York, N. Y.

- Day, William B.,
465 State st., Chicago, Ill.
- De Forest, William P.,*
1477 Bedford ave., Brooklyn, N. Y.
- De Jonge, Cornelius,
36 Doughty st., Brooklyn, N. Y.
- De Lang, Alfred,
Broadway & 4th sts., Cincinnati, O.
- De Lorenzi, Albert,
Main & Ervay sts., Dallas, Tex.
- Dearborn, George L.,*
156 Main st., New Market, N. H.
- Deck, Lewis C.,
Girard, Macoupin co., Ill.
- Deemer, Geo. M. H.,
opp. Steel Pier, Atlantic City, N. J.
- Dennin, Charles,
383 Court st., Brooklyn, N. Y.
- Dennin, Edwin C.,
383 Court st., Brooklyn, N. Y.
- Depeyre, Louis N.,
Goss st. & W. 41st ave., Denver, Colo.
- Devine, John,
Santa Monica, Cal.
- Dewender, Wm. H.,
167 Atlantic ave., Brooklyn, N. Y.
- Dewoody, William L.,
120 W. Barraque st., Pine Bluff, Ark.
- Dickinson, Arthur L.,
297 Main st., Danbury, Conn.
- Dickman, Gustave A.,
499 Selby ave., St., Paul, Minn.
- Diebert, Thomas I.,
103 North Centre st., Pottsville, Pa.
- DIEHL, C. LEWIS,
3d ave. & Broadway, Louisville, Ky.
- Diekman, George C.,
115 W. 68th st., New York, N. Y.
- Dillenback, Garrett V. d. V.,
144 State st., Albany, N. Y.
- Dilly, Oscar C.,
2101 W. Walnut st., Louisville, Ky.
- Dimmitt, Addison,
5th ave. & Walnut st., Louisville, Ky.
- Dimock, Robert H.,
303 Congress st., New Haven, Conn.
- Dinkler, Frank A.,
Hennessey, Okla. Ter.
- Dixon, J. Marion,
Julia st. & Washington ave., Titusville, Fla.
- Dobbins, Edward T.,
1511 Samson st., Philadelphia, Pa.
- Dodds, Richard N.,
5th & Monroe sts., Springfield, Ill.
- Dohme, Alfred R. L.,
Pratt & Howard sts., Baltimore, Md.
- DOHME, CHARLES E.,
Pratt & Howard sts., Baltimore, Md.
- Dohme, C. Louis,
Pratt & Howard sts., Baltimore, Md.
- DOHME, LOUIS,
Pratt & Howard sts., Baltimore, Md.
- Doliber, Thomas.*
Atlantic ave. & India st., Boston, Mass.
- Donaghue, James,
Second st., Girardville, Pa.
- Donaghue, Theresa V.,
Second st., Girardville, Pa.
- Donnel, Cornelius P.,
431 Arch st., Philadelphia, Pa.
- Dorr, George W.,
118 Main st., Waterville, Me.
- Doty, Wirt P.,
789 Woodward ave., Detroit, Mich.
- Dougherty, Samuel B.,
Chatham, N. J.
- Douglass, Henry,
614 Wythe ave., Brooklyn, N. Y.
- Dowdy, Joseph F.,
204 Main st., Little Rock, Ark.
- Downing, Benjamin F., Jr.,
42 Broadway, Newport, R. I.
- Drach, George L.,
1829 Broadway, Cleveland, O.
- Drake, Frederick T.,
7 Myrtle st., Stoneham, Mass.
- DRAKE, JOHN R.,
365 E. Water st., Milwaukee, Wis.
- Drake, Wallace C.,
1238 Euclid ave., Cleveland, O.
- Drechaler, Frank X.,
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110 First st., Hoboken, N. J.
- Knabe, Gustavus A.,
Court Square & Dexter ave., Montgomery, Ala.
- Knight, William C.,
P. O. Box 819, Carrollton, Mo.
- Knoebel, Thomas,
209 Collinsville ave., East St. Louis, Ill.
- Knoefel, Bruno,
1419 E. Spring st., New Albany, Ind.
- Knoefel, Charles D.,
110 E. Market st., New Albany, Ind.
- Knox, James W. T.,
242 Bellevue ave., Detroit, Mich.
- Koch, Julius A.,
Bluff & Pride sts., Pittsburg, Pa.
- Koch, Louis,
329 N. 4th st., Philadelphia, Pa.
- Koelle, Otto C.,
518 Wall st., Sioux City, Ia.
- Koeneke, Charles H.,
6621 Manchester ave., St. Louis, Mo.
- Kolb, William W.,
M. H. S., Savannah Quarantine Station, Ga.
- Kolsch, Julius,
202 Harrison ave., Leadville, Colo.
- Kornmann, Henry,
831 Harlem ave., Baltimore, Md.
- Kosminsky, Leonce J.,
9 W. Lafayette ave., Baltimore, Md.
- KRAEMER, HENRY,
424 S. 44th st., Philadelphia, Pa.
- Krause, John,
789 Woodland ave., Cleveland, O.
- Kremers, Edward,
Univ. of Wisconsin, Madison, Wis.
- Krewson, William E.,
1822 N. Franklin st., Philadelphia, Pa.
- Krueger, Owen W.,
5th & Broadway, Kansas City, Mo.
- Kuder, William F.,
342 Jennings ave., Cleveland, O.
- Kuehne, Charles,
571 Central ave., Jersey City Heights, N. J.
- La Pierre, Elie H.,
96 River st., Cambridgeport, Mass.
- La Wall, Charles H.,
115 N. 50th st., Philadelphia, Pa.
- Lachance, Seraphin,
1538 St. Catharine st., Montreal, Can.
- Laird, John,
Russellville, Pope Co., Ark.
- Lamar, Henry J.,
519 Forsyth st., Vineville, Macon, Ga.
- Lamar, William R.,
Mallinckrodt Chem. Works, St. Louis, Mo.
- Lampa, Robert R.,
120 William st., New York, N. Y.
- Lauctot, Henri,
299½ St. Lawrence st., Montreal, Can.
- LAND, ROBERT H.,
812 Broad st., Augusta, Ga.
- Land, Robert H., Jr.,
1134 Broad st., Augusta, Ga.
- Larrabee, John,
506 Main st., Melrose, Mass.
- Lauricella, Felice,
275 Hanover st., Boston, Mass.
- Layton, Thomas,
2743 N. Grand ave., St. Louis, Mo.
- Le Richeux, Alfred C.,
405 E. 4th st., Duluth, Minn.
- LEE, JAMES A.,
Main st., New Iberia, La.
- Legel, John G.,
Charles City, Ia.
- Lehr, Philip,
1145 Lorain st., Cleveland, O.
- Lehritter, George P.,
141 W. 130th st., New York, N. Y.

- Legendre, Joseph A.,
 201 Dauphine st., New Orleans, La.
 LEIS, GEORGE,
 747 Massachusetts st., Lawrence, Kan.
 LEMBERGER, JOSEPH L.,
 5 N. Ninth st., Lebanon, Pa.
 Leslie, William A.,
 Morganton, N. C.
 Leverty, John A.,
 1655 Main st., Bridgeport, Conn.
 Levinson, Joseph,
 11 Main st., Napa, Cal.
 Levy, Adolph,
 996 Broadway, Brooklyn, N. Y.
 Levy, William M.,
 420 Magazine st., New Orleans, La.
 Lewis, Ernest G.,
 701 Centre st., Jamaica Plain, Mass.
 Lichthardt, George H. P.,
 1800 M St., Sacramento, Cal.
 Ligon, J. Temple,
 P. O. Box 231, Anderson, S. C.
 Lillie, Foreas B.,
 204 Harrison ave., Guthrie, Okla. Ter.
 Lilly, Josiah K.,
 Indianapolis, Ind.
 Lindly, John M.,
 Winfield, Henry Co., Ia.
 Lindvall, Gus.,
 15th st. & 5th ave., Moline, Ill.
 LLEWELLYN, JOHN F.,
 Public Square, Mexico, Audrain Co., Mo.
 LLOYD, JOHN U.,
 Court & Plum sts., Cincinnati, O.
 Lo Sardo, Antonino,
 123 Navy st., Brooklyn, N. Y.
 Lockie, James A.,
 1128 Main st., Buffalo, N. Y.
 Lochr, Theodore C.,
 Carlinville, Macoupin Co., Ill.
 Lohmann, Herman J.,
 90 Monticello ave., Jersey City, N. J.
 Lohmeyer, Henry L.,
 1901 Carson st., Pittsburg, Pa.
 Long, John P.,
 U. S. Marine Sta., Isabela de Babilon, P. I.
 Loomis, John C.,
 Chestnut & Watt sts., Jeffersonville, Ind.
 Lord, Thomas,
 233 Randolph st., Chicago, Ill.
 Louis, Henry,
 Dubuque & Washington sts., Iowa City, Ia.
 Lovis, Henry C.,
 2137 7th ave., New York, N. Y.
 Lovvorn, James L.,
 Bowdon, Ga.
 Lowd, John C.,
 43 Temple Place, Boston, Mass.
 Lowe, Clement B.,
 Phil-Ellena st. & Germant'n ave., Phila., Pa.
 Lowe, John W.,
 532 Howard ave., New Haven, Conn.
 Lowell, Edward M.,
 114 Lisbon st., Lewiston, Me.
 Lueder, Fritz,
 509 S. Adams st., Peoria, Ill.
 Lunney, William J.,
 Seneca, S. C.
 Luve, Frank A. A.,
 Army General Hospital, Washington, D. C.
 Lynch, Frank K.,
 87 Hampshire st., Cambridge, Mass.
 Lyon, George C.,
 225 Westminster st., Providence, R. I.
 Lyons, Albert B.,
 72 Brainard st., Detroit, Mich.
 Lyons, Isaac L.,
 224 Camp st., New Orleans, La.
 MacFadden, Warren L.,
 62 Madison ave., Detroit, Mich.
 MacRae, John Y.,
 P. O. Box 66, Norfolk, Va.
 Mack, George C.,
 Bristol, S. Dak.
 Macnair, Whitmel H.,
 Main st., Tarboro, N. C.
 Macy, Sherman R.,
 Highland Park Normal Coll., Des Moines, Ia.
 Maguire, Edward S.,
 Fort Stanton, N. Mex.
 MAIN, THOMAS F.,
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 Maisch, Henry,
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 Major, John R.,
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 Mallinckrodt, Edward,
 Mallinckrodt & Main sts., St. Louis, Mo.
 Mansfield, Samuel,
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 Mares, Ferdinand L.,
 20th & Pierce sts., Omaha, Neb.
 Mares, Frank M.,
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 Markoe, George B.,
 106 Main st., Brockton, Mass.
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 U. S. Nav. Dispensary, Washington, D. C.
 Martin, Nicholas H.,
 Ravenswood L. Fell, Gateshead-on-Tyne, Eng
 Mason, Harry B.,
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 Matson, Geo. H., Jr.,
 662 E. Long st., Columbus, O.
 Matthews, Charles E.,
 221 Randolph st., Chicago, Ill.
 Matusow, Harry,
 S. W. cor. 3d st. & Columbia ave., Phila., Pa.
 May, Charles C.,
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 May, Edward,
 Navy Yard Dispensary, Norfolk, Va.
 May, James O.,
 Water st., Naugatuck, Conn.
 May, Louis,
 1359 Third ave., Brooklyn, N. Y.
 Mayo, Caswell A.,
 66 W. Broadway, New York, N. Y.
 Mayo, Frederick W.,
 173 6th st., Memphis, Tenn.
 McAdams, Harry K.,
 Main & Upper sts., Lexington, Ky.
 McClearn, Henry T.,
 Boothbay Harbor, Me.
 McConnell, Chas. H.,
 84 State st., Chicago, Ill.
 McDonald, George,
 Main & Burdick sts., Kalamazoo, Mich.
 McElhenie, Thomas D.,
 259 Ryerson st., Brooklyn, N. Y.
 McGill, John T.,
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 McIntyre, Ewen,
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 McIntyre, William,
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 McKenzie, Hugh H.,
 392 Cedar ave., Cleveland, O.
 McKesson, G. Clinton,
 91 Fulton st., New York, N. Y.
 McKesson, John, Jr.,
 91 Fulton st., New York, N. Y.
 McKinney, Robert S.,
 Taneytown, Md.
- McLarty, Colin,
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 McMahon, Joseph,
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 McNair, John S.,
 Ashland, Jackson Co., Ore.
 McPherson, George,
 Blue Island, Ill.
 Meisburger, William J.,
 Webster Groves, Mo.
 Meissner, Frederick W., Jr.,
 820 Main st., La Porte, Ind.
 Mellor, Alfred,
 218 N. 22d st., Philadelphia, Pa.
 Menk, Charles W.,
 106 Market st., Newark, N. J.
 Mente, Alvin W.,
 125 E. 3d st., Kansas City, Mo.
 Mentzer, Harvey H.,
 245 W. Cheltenham ave., Germantown, Phila., Pa.
 Mercer, William E.,
 Barry, Pike Co, Ill.
 Meredith, H. Lionel,
 319 Washington st., Hagerstown, Md.
 Merrell, Charles G.,
 5th & Butler sts., Cincinnati, O.
 Merrell, George,
 5th & Butler sts., Cincinnati, O.
 Merrell, George R.,
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 Merrem, Charles D.,
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 Methudy, Joseph P.,
 2759 Russell ave., St. Louis, Mo.
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 Prytanian st., New Orleans, La.
 Metzger, Matthias C.,
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 Meyer, Charles L.,
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 MEYER, CHRISTIAN F. G.,
 4th st. & Clark ave., St. Louis, Mo.
 Meyer, Martin M.,
 118 N. Main st., South Bend, Ind.
 Meyer, Theodore F.,
 4th st. & Clark ave., St. Louis, Mo.
 Michaelis, Gustavus,
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 Michalek, John,
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 Michels, Victor C.,
 W. Side Square, Albion, Ill.

- Myers, Preston B.,
1523 Farnam st., Omaha, Neb.
- Nachtwey, Frank J.,
1347 Clay st., Dubuque, Ia.
- Nattans, Arthur,
Cor. Lexington & Howard sts., Balto., Md.
- Naylor, William W.,
Holton, Jackson Co., Kan.
- Neeley, Guy M.,
254 11th st. S. E., Washington, D. C.
- Nelson, Burt E.,
Binghamton State Hosp., Binghamton, N. Y.
- Neville, William R.,
915 Colorado st., Austin, Tex.
- NEWMAN, GEORGE A.,
5th & Walnut sts., Louisville, Ky.
- Nichols, John C.,
119 State st., New London, Conn.
- Nichols, Thomas B.,
180 Essex st., Salem, Mass.
- Nicholson, Edgar L.,
1444 Holly st., New Whatcom, Wash.
- Nielson, John,
Ortonville, Minn.
- Nixon, Charles F.,
Leominster, Mass.
- Noll, Martin J.,
925 Goodfellow ave., St. Louis, Mo.
- Noll, Matthias,
605 Atchison st., Atchison, Kan.
- Nordmann, Herman,
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- Norton, George E.,
223 Putnam ave., Cambridgeport, Mass.
- O'Gorman, Theophilus V.,
U. S. Marine Hospital, New Orleans, La.
- O'Hare, James,
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- Ogier, John M.,
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- Ogier, William R.,
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- OHLIGER, LEWIS P.,
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- Oldberg, Oscar,
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- Oleson, Olaf M.,
Fort Dodge, Ia.
- Oliff, James H.,
200 Arlington ave., Plainfield, N. J.
- Oliver, William M.,
132 Broad st., Elizabeth, N. J.
- ORNE, JOEL S.,
493 Main st., Cambridgeport, Mass.
- Ortiz, Miguel A.,
115 Prado st., Havana, Cuba.
- Orton, Ingomar F.,
2113 Market st., Galveston, Tex.
- Osseward, Cornelius,
c.o. Stewart & Holmes Drug Co., Seattle, Wash.
- Oster, Frank C.,
1261 St. Clair st., Cleveland, O.
- Osterlund, Otto W.,
46th st. & Baltimore ave., Philadelphia, Pa.
- Ottinger, James J.,
20th & Spruce sts., Philadelphia, Pa.
- Otto, John N. W.,
76 S. Rampart st., New Orleans, La.
- Otto, Theodor G. E.,
402 Washington st., Columbus, Ind.
- OWENS, RICHARD J.,
Myrtle ave. & Spencer st., Brooklyn, N. Y.
- Paddock, Morris V.,
Union st., St. John, N. B., Can.
- Palmer, John D.,
Monticello, Fla.
- Parisen, George W.,
Smith & High sts., Perth Amboy, N. J.
- Parker, Frederick M.,
364 Wabasha st., St. Paul, Minn.
- Parmalee, Walter W.,
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- Parsons, Chas. W.,
156 Fifth ave., New York, N. Y.
- Parsons, John,
194 31st st., Chicago, Ill.
- Partridge, Frank R.,
Water st., Augusta, Me.
- Patch, Edgar L.,
P. O. Box 639, Stoneham, Mass.
- Patrick, Elmer A.,
615 Main st., Sharpsburg, Pa.
- Patten, Eustis,
154 W. Main st., Carbondale, Ill.
- Patten, I. Barilett,
594 Washington st., Boston, Mass.
- Patterson, Theodore H.,
3640 Cottage Grove ave., Chicago, Ill.
- Pattison, George H.,
88 S. Market st., Chicago, Ill.

Pauley, Frank C.,
 Eastern st. & Compton ave., St. Louis, Mo.
 Payne, George F.,
 43½ Whitehall st., Atlanta, Ga.
 Peacock, Bertha L. (Mrs.),
 2012 S. 10th st., Philadelphia, Pa.
 Peacock, Josiah C.,
 2012 S. 10th st., Philadelphia, Pa.
 Pearce, Howard A.,
 370 Elmwood ave., Providence, R.I.
 Peerman, Wm. E.,
 U.S.T.S., Pensacola, Sta. D., San Francisco, Cal.
 Pearson, Joseph F.,
 Naval Academy, Annapolis, Md.
 Pease, Autumn V.,
 Fairbury, Neb.
 Peck, George L.,
 Hall of Pharmacy, Jamaica, N. Y.
 Pennock, Edward,
 52 Maiden Lane, New York, N. Y.
 Perkins, Benjamin A.,
 94 Commercial st., Portland, Me.
 Perkins, C. William,
 1 East Main st., Waterbury, Conn.
 Perkins, George H.,
 Water st., North Andover Depot, Mass.
 Perry, Frederick W. R.,
 709 Woodward ave, Detroit, Mich.
 Peter, Minor C.,
 832 Sixth st., Louisville, Ky.
 Peterson, John N.,
 202 Ave. D, Bayonne, N. J.
 Petsche, Bismark Wm.,
 Arlington Chemical Co., Yonkers, N. Y.
 PETTIT, HENRY M.,
 15 S. Main st., Carrollton, Mo.
 Pfaff, Franz,
 871 Boylston st., Boston, Mass.
 Pfafflin, Henry A.,
 Care of J. E. Wingood, Asheville, N. C.
 Pfeiffer, William J.,
 1301 Geyer ave., St. Louis, Mo.
 Philibert, Leon D.,
 2631 Gamble st., St. Louis, Mo.
 Phillips, Carrie E. (Miss),
 81 Concord ave., Cambridge, Mass.
 Pleck, Edward L.,
 6th & Main sts., Covington, Ky.
 Pierce, William H.,
 316 Shawmut ave., Boston, Mass.

Pilkington, William B.,
 1016 N. Garrison ave., St. Louis, Mo.
 Pilson, Abram O.,
 1327 W. Baltimore st., Baltimore, Md.
 Pine, Warren C.,
 Riverside, Burlington Co., N. J.
 Pippert, Nicholas J.,
 2821 Dickson st., St. Louis, Mo.
 Pitt, John R.,
 218 Main st., Middletown, Conn.
 Placak, Harry,
 1446 Pearl st., Cleveland, O.
 Plant, Albert,
 128 William st., New York, N. Y.
 Poole, William E.,
 25 State st., Montpelier, Vt.
 Porter, Chilton S.,
 Somerset, Pulaski Co., Ky.
 PORTER, HENRY C.,
 Main & Pine sts., Towanda, Pa.
 Post, Arthur E.,
 458 9th st., Brooklyn, N. Y.
 Potter, William R.,
 100 Broad st., Providence, R. I.
 Potts, David G.,
 224 Market st., Philadelphia, Pa.
 Powell, William C.,
 Snow Hill, Md.
 Powell, William D.,
 Excello, Macon Co., Mo.
 POWER, FREDERICK B.,
 6 King st., Snow Hill, London, Eng.
 Prall, Delbert E.,
 201 Genesee ave., Saginaw, Mich.
 Preissler, Henry W.,
 Shelbyville, Ky.
 PRESCOTT, ALBERT B.,
 University of Michigan, Ann Arbor, Mich.
 Preston, Andrew P.,
 2 Congress Block, Portsmouth, N. H.
 Price, Charles H.,
 226 Essex st., Salem, Mr
 Price, Joseph,
 226 Essex st., Salem, '
 Pringle, James M.,
 977 8th ave., New Yor'
 Prutzman, Charles O.,
 104 S. Walnut st., Mr
 Puckner, William A.,
 73 Wells st.,

- Punch, William F.,
71 Dauphin st., Mobile, Ala.
- Pursel, Robert C.,
2778 Kensington ave., Philadelphia, Pa.
- Quackinbush, Benjamin F.,
703 Greenwich st., New York, N. Y.
- Quandt, Arthur A.,
Cor. Howard & Lombard sts., Baltimore, Md.
- Quandt, Ernest E.,
Cor. Howard & Lombard sts., Baltimore, Md.
- Quigley, Richard L.,
2036 G st. N. W., Washington, D. C.
- Quin, Frank W.,
1117 S. Franklin st., New Orleans, La.
- Raeuber, Edward G.,
44 Johnson st., Milwaukee, Wis.
- Rains, A. Brown,
11 W. 7th st., Columbia, Tenn.
- Ramaley, Francis,
University of Colorado, Boulder, Colo.
- Ramsaur, David W.,
201 Lemon st., Palatka, Fla.
- RAMSPERGER, GUSTAVUS,
212 E. 18th st., New York, N. Y.
- Rand, Daniel M.,
Main & Depot sts., S. Windham, Me.
- Randall, Frank O.,
101 N. Main st., Brockton, Mass.
- Rano, Charles O.,
275 Niagara st., Buffalo, N. Y.
- Rapelye, Charles A.,
853 Main st., Hartford, Conn.
- Raubenheimer, Otto,
1341 Fulton st., Brooklyn, N. Y.
- Rauch, Henry,
1228 Main st. N. E., Minneapolis, Minn.
- Rauschenberg, Sidney,
29 S. 12th ave., Mount Vernon, N. Y.
- Rauschkolb, John,
251 S. 4th st., Columbus, O.
- Reade, Frank M.,
307 E. Grace st., Richmond, Va.
- Redsecker, Jacob H.,
810 Cumberland st., Lebanon, Pa.
- Reed, Willoughby H.,
Marshall & Astor sts., Norsistown, Pa.
- Reeves, Sidney H.,
Seven Corners, St. Paul, Minn.
- Reidy, Michael,
Shiawassee ave., Corunna, Mich.
- Reilly, Robert C.,
3300 Meramec st., St. Louis, Mo.
- Reimann, George,
405 Genesee st., Buffalo, N. Y.
- Remington, J. Percy,
36 Doughty st., Brooklyn, N. Y.
- REMINGTON, JOSEPH P.,
1832 Pine st., Philadelphia, Pa.
- Renshaw, Thomas W.,
Lansford, Carbon Co., Pa.
- Reynolds, Charles E.,
U.S.R.S. Columbia, Navy Yard, New York, N. Y.
- Reynolds, John J.,
Water & Main Cross sts., Flemingsburg, Ky.
- Rhode, Rudolph E.,
504 N. Clark st., Chicago, Ill.
- Rhodes, Chas. O.,
4 Main st., Groton, N. Y.
- Rich, W. Pitt,
Grove ave., Verona, Essex Co., N. J.
- Richardson, Edwin S.,
520 N. Washington st., Marshall, Tex.
- Richardson, Horatio S.,
Main st., Concord, Mass.
- Richardson, Samuel W.,
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- Richardson, Thomas L.,
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- Richardson, Willard S.,
316 4½ st. S. W., Washington, D. C.
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- Ridgway, William F.,
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- Riley, Russell,
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- Robertson, Felix O.,
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- Robins, Wilbur F.,
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- Robinson, Ernest F.,
Huntingdon Valley, Montgomery Co., Pa.
- ROBINSON, JAMES S.,
2d & Madison sts., Memphis, Tenn.
- Robinson, William J. M.,
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- Rockefeller, Howard,
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 Rockefeller, Lucius,
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 Rodemoyer, William E.,
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 U. S. M. Hosp., Stapleton, Staten Is., N. Y.
 Roeller, Edward F.,
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 Roesch, Anton,
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 Rogers, Arthur H.,
 Geneseo, Livingston Co., N. Y.
 Rogers, Edward,
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 Rogers, Henry H.,
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 Rogers, William H.,
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Rollins, John F.,
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 Rose, Herman L.,
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 Rosenzweig, Benj.,
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 RUMSEY, SAMUEL L.,
 Fort & Hotel sts., Honolulu, H. I.
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 Ruppert, John,
 Price Hill, Cincinnati, O.
 Rusby, Henry H.,
 115 W. 68th st., New York, N. Y.
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 Sadtler, Samuel P.,
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 SANDER, ENNO,
 129 S. 11th st., St. Louis, Mo.
 Sanford, John F.,
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 Schiemann, Edward B.,
 M & Walnut sts., Louisv'
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- Schmidt, Frederick M.,
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- Schmidt, Joseph H.,
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- Schmidt, Oscar W.,
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- Schmidt, Valentine,
Polk & Jackson sts., San Francisco, Cal.
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- Schmitter, Jonathan,
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- Schneider, Albert,
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- Schoenhut, Christie H.,
199 Superior st., Cleveland, O.
- Schoenthaler, John P.,
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- Schoettlin, Albert J.,
4th & Chestnut sts., Louisville, Ky.
- Schrader, August C.,
Elliot & Curley sts., Baltimore, Md.
- Schrank, C. Henry,
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- Schreiber, August,
8th & Humboldt sts., Tell City, Ind.
- Schreiner, Oswald,
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- Schuessler, Frederick W.,
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- Schuh, Paul G.,
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- Schulze, Louis,
631 S. Patterson Park ave., Baltimore, Md.
- Schumann, Otto G.,
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- Schutz, Chris,
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	Elected.
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Ameling, Frank H.,	1901
Arrington, Homer H.,	1892
Broe, James A.,	1898
Button, Chas. E.,	1881
Chelf, T. Wilber,	1900
Davis, Wm. M.,	1879
de Wyl, Fredrica (Miss),	1901
Elkin, Wm. S., Jr.,	1902
Fink, Fred'k W.,	1886
Guisse, P. Nettleton,	1897
Hartwig, Otto J.,	1892
Henry, Chas. L.,	1893
Humma, Henry J.,	1900
Hutton, Harry D.,	1891
Kimball, Rich'd H.,	1900
Kirk, Jas. E.,	1896
Klein, Frederick,	1893
Krieger, Philip,	1876
Latin, George,	1900
Lockert, Chas. L.,	1894
Marshall, Ernest C.,	1875
Minner, Louis A.,	1901
Mumma, Edgar,	1897
Newton, Philo W.,	1892
Nipgen, John A.,	1879
Roe, Wm. G.,	1900
Root, Wilfred F.,	1898
Shannon, Thos. R. A.,	1892
Silverburg, Victor E.,	1901
Taylor, Mallory H.,	1898
Tracy, David,	1892
Watters, Henry,	1896
Bayonne, N. J.,	
St. Louis, Mo.,	
Summerville, Ga.,	
Portland, Me.,	
Chicago, Ill.,	
Richmond, Va.,	
East Orange, N. J.,	
Jefferson City, Mo.,	
Atlanta, Ga.,	
St. Louis Park, Minn.,	
Philadelphia, Pa.,	
Chicago, Ill.,	
Washington, D. C.,	
Metropolis, Ill.,	
Washington, D. C.,	
Hartford, Conn.,	
Jacksonville, Fla.,	
Chicago, Ill.,	
Brooklyn, N. Y.,	
Dayton, O.,	
Clarksville, Tenn.,	
Charlestown, Mass.,	
Murphysboro, Ill.,	
Hagerstown, Md.,	
Hartford, Conn.,	
Chillicothe, O.,	
Washington, D. C.,	
Brattleboro, Vt.,	
Hartford, Conn.,	
Muncie, Ind.,	
Macon, Ga.,	
Hartford, Conn.,	
Ottawa, Can.,	

	Elected.
Eddy, Henry C.,	1869
Faulkner, Garland E.,	1898
Fischer, Oscar F.,	1892
Forston, Keene R.,	1899
Greene, Lester H.,	1899
Hill, Frederick J.,	1895
Hyden, Carl,	1892
Johnson, D. Dudley,	1894
Johnson, Joseph H.,	1899
Johnson, Louise L.,	1898
Joy, Edwin W.,	1882
Lincoln, George W.,	1899
Lundberg, John C.,	1892
Lyons, Fred. W.,	1893
Massie, Paul,	1899
McGeorge, William,	1895
McIntyre, Byron F.,	1876
McMonies, Thomas L.,	1897
Neal, Charles C.,	1899
Paine, Charles J.,	1899
Portmann, Caesar A.,	1897
Price, Roger T.,	1899
Procter, Wallace,	1874
Ray, Peter W.,	1892
Robinson, Edward A.,	1888
Sanborn, George C.,	1899
Schellentrager, Ernst A.,	1882
Scott, Theodore W.,	1899
Sheehy, Henry L.,	1898
Steiner, Samuel G.,	1899
Taylor, Walter T.,	1891
Thomas, John B.,	1898
Thompson, Albert E.,	1898
Trefethen, Frederick J.,	1899
Urban, Jacob P.,	1881
Waggener, Richard,	1899
Wagner, Henry,	1876
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Philadelphia, Pa.,	
Brooklyn, N. Y.,	
Lowell, Mass.,	
Northfield, Vermont,	
Cleveland, Ohio,	
League Island, Pa.,	
Sherman, Texas,	
Nashville, Tenn.,	
New Orleans, La.,	
Baltimore, Md.,	
Baltimore, Md.,	
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Cleveland, Ohio,	
Warrington, Florida,	
Cincinnati, Ohio,	
New York, N. Y.,	
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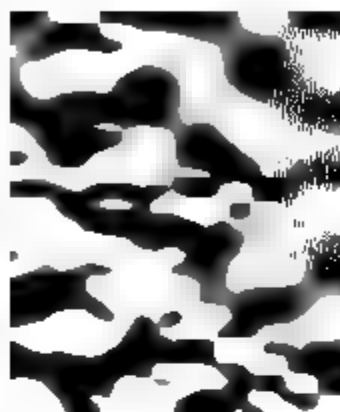
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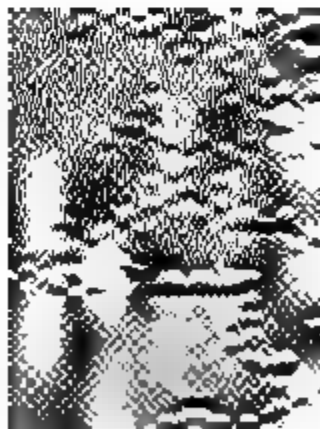
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45. Jos. E. Morrison, Montreal, Can., President 1896-97; 3d Vice President 1894-95; Local Secretary 1896.
46. A. B. Prescott, Ann Arbor, Mich., President 1899-00; 2d Vice President 1885-86; Member of the Council 1901-02.
47. John F. Patton, York, Pa., President 1900-01; Member of the Council 1902-05.
48. Chas. E. Dohme, Baltimore, Md., President 1896-99; 1st Vice President 1895-96; 2d Vice President 1890-91; Local Secretary 1890; Member of the Council 1892-95, 96-98, 99-02.
49. Henry M. Whelpley, St. Louis, Mo., President 1901-02; Local Secretary 1901; Member of the Council 1890-93, 94-97, 99-01, 1902-05; Secretary of Section on Pharmaceutical Education 1887-88; Chairman of Section on Scientific Papers 1889-90.
50. Geo. D. Coggeshall, New York, N. Y., 1st Vice President 1853-54; Recording Secretary 1852-53.
51. Geo. F. Payne, Atlanta, Ga., President 1902-03; 1st Vice President 1896-97, 1898-99; 2d Vice President 1901-02; Member of the Council 1897-00.
52. H. T. Cummings, Portland, Me., 1st Vice President 1854-55.
53. Ed. R. Squibb, Brooklyn, N. Y., 1st Vice President 1858-59.
54. Ferris Bringham, Wilmington, Del., 1st Vice President 1868-69.
55. R. J. Brown, Leavenworth, Kan., 1st Vice President 1867-68.
56. John M. Maisch, Philadelphia, Pa., 1st Vice President 1868-64; Permanent Secretary 1865-93; Corresponding Secretary 1862-63.
57. Fred'k W. Sennewald, St. Louis, Mo., 1st Vice President 1869-70.
58. S. S. Garrigue, East Saginaw, Mich., 1st Vice President 1872-73.
59. Geo. C. Close, Brooklyn, N. Y., 1st Vice President 1865-66.
60. F. G. Grieve, Milledgeville, Ga., 1st Vice President 1870-71.
61. Ewen McIntyre, New York, 1st Vice President 1877-78.
62. S. A. D. Sheppard, Boston, Mass., 1st Vice President 1876-77; Local Secretary 1875; Member of the Council 1880-86; Treasurer 1886-1903.
63. Frederick Hoffmann, New York, N. Y., 1st Vice President 1875-76; Honorary Chairman of the Golden Jubilee Session 1902.
64. Geo. H. Schafer, Madison, Ia., 1st Vice President 1880-81.
65. Frederick T. Whiting, Great Barrington, Mass., 1st Vice President 1878-79.
66. T. Roberts Baker, Richmond, Va., 1st Vice President 1875-76; 2d Vice President 1879-80; Member of the Council 1900-03.
67. James Vernon, Detroit, Mich., 1st Vice President 1888-89; Local Secretary 1888.
68. Chas. Rice, New York, N. Y., 1st Vice President 1883-84; Reporter on Progress of Pharmacy 1891-92.
69. Henry J. Menninger, Brooklyn, N. Y., 1st Vice President 1886-87; Member of the Council 1880-86.
70. Alvisio B. Stevens, Ann Arbor, Mich., 1st Vice President 1890-91; Secretary of Section on Pharmaceutical Education and Legislation 1889-90; Chairman of Section on Pharmaceutical Education and Legislation 1891-92.
71. John A. Dadd, Milwaukee, Wis., 1st Vice President 1884-85.
72. Geo. J. Seabury, New York, N. Y., 1st Vice President 1891-92; Chairman of Section on Commercial Interests 1894-96.
73. Andrew P. Preston, Portsmouth, N. H., 1st Vice President 1892-93.
74. Albert H. Hollister, Madison, Wis., 1st Vice President 1885-86; Member of the Council 1886-89.
75. Chas. M. Ford, Denver, Col., 1st Vice President 1894-95; Member of the Council 1889-94, 1895-98; Secretary of Section on Scientific Papers 1893-94.
76. Geo. C. Bartels, Camp Point, Ill., 1st Vice President 1897-98.
77. Karl Simmon, St. Paul, Minn., 1st Vice President 1889-90; 3d Vice President 1877-86.
78. Lewis C. Hopp, Cleveland, O., 1st Vice President 1899-00; Local Secretary 1899; Member of the Council 1887-90, 1900-03.
79. Wm. L. Cliffe, Philadelphia, Pa., 1st Vice President 1902-03; Local Secretary 1902.
80. Wm. M. Searby, San Francisco, Cal., 1st Vice President 1869-70, 1901-02.
81. Jas. H. Beal, Scioto, O., 1st Vice President 1900-01; 2d Vice President 1898-99; Member of the Council 1901-04.
82. Jas. O. Gallagher, St. Louis, Mo., 2d Vice President 1858-59.
83. Eugene L. Massot, St. Louis, Mo., 2d Vice President 1862-63; 1st Vice President 1870-71.
84. W. Silver Thompson, Baltimore, Md., 2d Vice President 1860-61.
85. Ed. P. Nichols, Newark, N. J., 2d Vice President 1872-73.
86. N. Hynson Jennings, Baltimore, Md., 2d Vice President 1867-68.
87. Elijah W. Sackrider, Cleveland, O., 2d Vice President 1865-66.
88. Henry J. Rose, Toronto, Can., 2d Vice President 1878-79; Local Secretary 1877.
89. Ed. S. Wayne, Cincinnati, O., 2d Vice President 1868-69; Recording Secretary 1854-55.
90. Jas. G. Steele, San Francisco, Cal., 2d Vice President 1870-71.
91. Jos. L. Lemberger, Lebanon, Pa., 2d Vice President 1879-80; Member of the Council 1881-87.
92. Wm. T. Wenzell, San Francisco, Cal., 2d Vice President 1874-75.
93. Jno. T. Buck, Jackson, Miss., 2d Vice President 1873-74.
94. Henry Canning, Boston, Mass., 2d Vice President 1884-85; Member of the Council 1888-91.
95. Geo. Lels, Lawrence, Kan., 2d Vice President 1881-82.
96. Fred'k Wilcox, Waterbury, Conn., 2d Vice President 1888-89.
97. Louis Dohme, Baltimore, Md., 2d Vice President 1882-83.
98. W. H. Torbert, Dubuque, Ia., 2d Vice President 1891-92; Chairman of Section on Commercial Interests 1891-93.

99. Sidney P. Watson, Atlanta, Ga., 2d Vice President 1-92-93; Member of the Council 1-94-97.
100. Wiley Rogers, Louisville, Ky., 2d Vice President 1893-94.
101. John N. Hurty, Indianapolis, Ind., 2d Vice President 1891-95; Secretary of Section on Pharmaceutical Legislation 1-88-89.
102. Wm. A. Frost, St. Paul, Minn., 2d Vice President 1-96-97; Member of the Council 1897-00.
103. Eugene G. Eberle, Dallas, Tex., 2d Vice President 1902-03; Chairman of Section on Pharmaceutical Education 1901-02.
104. Wm. L. Dewoody, Pine Bluff, Ark., 2d Vice President 1899-00.
105. A. Brandenberger, Jefferson City, Mo., 2d Vice President 1895-96.
106. John W. Gayle, Frankfort, Ky., 2d Vice President 1900-01.
107. Edw. O. Gale, Chicago, Ill., 3d Vice President 1859-60.
108. Henry F. Fish, Waterbury, Conn., 3d Vice President 1855-56.
109. Thomas Hollis, Boston, Mass., 3d Vice President 1864-65.
110. Theo. Metcalf, Boston, Mass., 3d Vice President 1860-61.
111. Geo. W. Weyman, Pittsburg, Pa., 3d Vice President 1863-64.
112. Matthew F. Ash., Jackson, Miss., 3d Vice President 1871-72.
113. Henry C. Gaylord, Cleveland, O., 3d Vice President 1872-73; Local Secretary 1872.
114. Daniel Henschman, Boston, Mass., 3d Vice President 1867-68.
115. Joel S. Orne, Cambridgeport, Mass., 3d Vice President 1869-70.
116. C. F. G. Meyer, St. Louis, Mo., 3d Vice President 1875-76.
117. A. R. Bayley, Cambridgeport, Mass., 3d Vice President 1874-75.
118. Wm. H. Crawford, St. Louis, Mo., 3d Vice President 1878-79; Local Secretary 1871.
119. P. C. Candidus, Mobile, Ala., 3d Vice President 1879-80; Member of the Council 1886-89, 1890-93.
120. Paul Balluf, New York, N. Y., 3d Vice President 1873-74.
121. Wm. B. Blanding, Providence, R. I., 3d Vice President 1-82-83; Local Secretary 186.
122. Jacob D. Wells, Cincinnati, O., 3d Vice President 1876-77.
123. Ed. W. Runyon, New York, N. Y., 3d Vice President 1883-84; Local Secretary 1889.
124. Jos. S. Evans, West Chester, Pa., 3d Vice President 1885-86.
125. Chas. F. Goodman, Omaha, Neb., 3d Vice President 1884-85; Member of the Council 1890-93.
126. John F. Judge, Cincinnati, O., 3d Vice President 1881-82.
127. A. A. Yeager, Knoxville, Tenn., 3d Vice President 1888-89.
128. Wm. H. Averill, Frankfort, Ky., 3d Vice President 1892-93.
129. Norman A. Kuhn, Omaha, Neb., 3d Vice President 1886-87.
130. Joseph W. Eckford, Aberdeen, Miss., 3d Vice President 1889-90.
131. Mrs. M. O. Miner, Hiawatha, Kan., 3d Vice President 1895-96.
132. J. A. Miller, Harrisburg, Pa., 3d Vice President 1897-98.
133. Geo. W. Parisen, Perth Amboy, N. J., 3d Vice President 1896-97.
134. Edsel A. Ruddiman, Nashville, Tenn., 3d Vice President 1900-01.
135. Chas. Caspari, Jr., Baltimore, Md., 3d Vice President 1893-94; Permanent Secretary 1894-96; General Secretary 1896-03.
136. Geo. W. Kennedy, Pottsville, Pa., Secretary of the Council 1880-1902.
137. Miss Josie A. Wanous, Minneapolis, Minn., 3d Vice President 1-98-99.
138. Henry R. Gray, Montreal, Can., 3d Vice President 1899-00.
139. Henry Willis, Quebec, Can., 3d Vice President 1902-03.
140. Ashel Boyden, Boston, Mass., Treasurer 1859-60.
141. Jas. S. Aspinwall, New York, N. Y., Treasurer 1856-57.
142. Henry Haviland, New York, N. Y., Treasurer 1860-63.
143. Henry Kraemer, Philadelphia, Pa., Reporter on the Progress of Pharmacy 1892-95.
144. Wm. Hegeman, New York, N. Y., Corresponding Secretary 1859-60.
145. J. Brown Baxley, Baltimore, Md., Treasurer 1863-65.
146. Wm. H. Rogers, Middletown, N. Y., Member of the Council 1886-88.
147. Gustavus Ramsperger, New York, N. Y., Member of the Council 1892-95.
148. Henry N. Rittenhouse, Philadelphia, Pa., Recording Secretary 1864-65.
149. Jacob H. Redsecker, Lebanon, Pa., Member of the Council 1890-91.
150. Wm. C. Alpers, New York, N. Y., Member of the Council 1893-96, 1900-03; Secretary of the Section on Scientific Papers 1895-96; Chairman of the Section on Scientific Papers 1-96-97.
151. Thos. Whitfield, Chicago, Ill., Member of the Council 1880-82.
152. J. H. Dawson, San Francisco, Cal., Member of the Council 1889-92.
153. C. S. N. Hallberg, Chicago, Ill., Secretary of the Section on Scientific Papers 1890-91; Chairman of the Section on Scientific Papers 1891-92; Secretary of the Section on Education and Legislation 1894-95; Chairman of the Section on Education and Legislation 1895-97; Member of the Council 1902-1905.
154. Wm. Dupont, Detroit, Mich., Member of the Council 18-7-90.
155. Geo. H. Hechler, Cleveland, O., Member of the Council 1895-98.
156. Jacob Burghelm, Houston, Tex., Member of the Council 1895-96.
157. Chas. A. Rapelye, Hartford, Conn., Member of the Council 1898-00, 1901-04; Secretary of the Section on Commercial Interests 1899-00; Chairman of the Section on Commercial Interests 1900-01.
158. Caswell A. Mayo, New York, N. Y., Member of the Council 1897-00.
159. C. L. Keppler, New Orleans, La., Member of the Council 1888-91.
160. Adam Conrath, Milwaukee, Wis., Member of the Council 1891-94.
161. Emil Scheffer, Louisville, Ky., Local Secretary 1874.
162. Chas. F. Fish, Saratoga, N. Y., Local Secretary 1880.
163. Geo. W. Voss, Cleveland, O., Local Secretary 1887; Member of the Council 1894-96.
164. Ed. L. Scholtz, Denver, Col., Local Secretary 1895.
165. Henry C. Schrank, Milwaukee, Wis., Local Secretary 1884.

166. Hiram E. Griffith, Niagara Falls, N. Y., Local Secretary 1882.
167. A. W. Miller, Philadelphia, Pa., Local Secretary 1876.
168. Henry Biroth, Chicago, Ill., Local Secretary 1893.
169. Geo. A. Kelly, Pittsburg, Pa., Local Secretary 1885.
170. Henry Fuller, Chicago, Ill., Local Secretary 1869.
171. Wm. T. Ford, Kansas City, Mo., Local Secretary 1881.
172. Whiteford G. Smith, Asheville, N. C., Local Secretary 1894.
173. Eli Lilly, Indianapolis, Ind., Local Secretary 1879.
174. Henry P. Hynson, Baltimore, Md., Local Secretary 1898; Chairman of Section on Practical Pharmacy and Dispensing 1900-01.
175. J. W. Colcord, Lynn, Mass., Secretary of the Section on Commercial Interests 1887-89.
176. T. Ashby Miller, Richmond, Va., Local Secretary 1900.
177. Chas. L. Becker, Washington, D. C., Local Secretary 1883.
178. C. T. P. Fennel, Cincinnati, O., Member of the Council 1891-94; Chairman of the Section on Scientific Papers 1892-93.
179. Henry H. Rusby, New York, N. Y., Chairman of the Section on Scientific Papers 1898-99.
180. Frank G. Ryan, Detroit, Mich., Secretary of the Section on Scientific Papers 1892-93; Chairman of the Section on Scientific Papers 1899-00.
181. Clayton W. Holmes, Elmira, N. Y., Secretary of the Section on Commercial Interests 1895-96.
182. Alfred R. L. Dohme, Baltimore, Md., Chairman of Section on Scientific Papers 1894-95.
183. Wm. F. Kaemmerer, Columbus, O., Secretary of the Section on Practical Pharmacy and Dispensing 1901-02.
184. Chas. F. Dare, Bridgeton, N. J., Secretary of the Section on Scientific Papers 1889-90.
185. Virgil Coblenz, New York, N. Y., Secretary of the Section on Scientific Papers 1896-97.
186. Harry B. Mason, Detroit, Mich., Secretary of the Section on Education and Legislation 1902-03.
187. Sam'l P. Sadtler, Philadelphia, Pa., Chairman of the Section on Scientific Papers 1895-96.
188. J. O. Schlotterbeck, Ann Arbor, Mich., Chairman of the Section on Scientific Papers 1902-03.
189. Geo. B. Kauffman, Columbus, O., Secretary of the Section on Scientific Papers 1894-95.
190. Albert B. Lyons, Detroit, Mich., Secretary of the Section on Scientific Papers 1887-8, 1897-98.
191. Wm. Simon, Baltimore, Md., Chairman of the Section on Education and Legislation 1890-91.
192. Clement B. Lowe, Philadelphia, Pa., Member of the Council 1901-04; Chairman of the Section on Pharmaceutical Education and Legislation 1899-01.
193. Oscar Oldberg, Chicago, Ill., Chairman of Section on Scientific Papers 1900-01.
194. Edward Kremers, Madison, Wis., Chairman of Section on Scientific Papers 1897-98.
195. Jos. W. England, Philadelphia, Pa., Secretary of Section on Scientific Papers 1901-03.
196. Jas. H. Bobbitt, Raleigh, N. C., Secretary of Section on Commercial Interests 1897-99.
197. Wm. H. Burke, Detroit, Mich., Secretary of Section on Practical Pharmacy and Dispensing 1902-03.
198. Eugene D'Avignon, Windsor, Can., Secretary of Section on Commercial Interests 1896-97.
199. Jas. O. Burge, Nashville, Tenn., Secretary of Section on Commercial Interests 1893-95.
200. Robert G. Eccles, Brooklyn, N. Y., Chairman of Section on Education and Legislation 1892-94.
201. Thos. V. Wooten, Chicago, Ill., Chairman of Section on Commercial Interests 1902-03.
202. Lyman F. Kebler, Philadelphia, Pa., Secretary of Section on Scientific Papers 1900-01; Chairman of Section on Scientific Papers 1901-02.
203. Julius A. Koch, Pittsburg, Pa., Secretary of Section on Education and Legislation 1899-1901.
204. L. C. Hogan, Chicago, Ill., Secretary of Section on Education and Legislation 1890-94.
205. F. W. E. Stedem, Philadelphia, Pa., Secretary of the Section on Practical Pharmacy and Dispensing 1900-01; Chairman of the Section on Practical Pharmacy and Dispensing 1901-02.
206. Harry V. Army, Cleveland, O., Secretary of Section on Scientific Papers 1898-99.
207. Wm. P. DeForest, Brooklyn, N. Y., Secretary of the Section on Pharmaceutical Legislation 1887-88.
208. H. Gordon Webster, Minneapolis, Minn., Secretary of the Section on Education and Legislation 1897-98.
209. Wm. C. Anderson, Brooklyn, N. Y., Secretary of section on Commercial Interests 1902-03.
210. Geo. M. Berlinger, Camden, N. J., Chairman of Section on Practical Pharmacy and Dispensing 1902-03.
211. Fred'k B. Kilmer, New Brunswick, N. J., Secretary of Section on Commercial Interests 1889-90.
212. Jas. W. T. Knox, Detroit, Mich., Secretary of Section on Education and Legislation 1901-02; Chairman of Section on Education and Legislation 1902-03.
213. Joseph Jacobs, Atlanta, Ga., Chairman of Section on Commercial Interests 1897-99.
214. F. W. Meissner, Jr., La Porte, Ind., Chairman of the Section on Commercial Interests 1901-02.
215. R. F. Bryant, Fargo, N. Dak., Chairman of Section on Pharmaceutical Legislation 1887-88.
216. Lucius E. Sayre, Lawrence, Kan., Chairman of the Section on Scientific Papers 1893-94; Secretary of Section on Pharmaceutical Education 1888-89.
217. J. W. Rankin, Atlanta, Ga., Local Secretary 1878.
218. Herbert W. Snow, Chicago, Ill., Secretary of Section on Scientific Papers 1891-92.



